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SECOND EDITION

OF

WARD'S

OCEAN MARINE TELEGRAPH,

Illustrated.

BY

WILLIAM HENRY WARD,
7, SACKVILLE STREET, PICCADILLY.

LONDON:
PUBLISHED BY THE AUTHOR.
January, 1861.

Entered at Stationers' Hall, January, 1860.

~~200. f. 4 123.~~

231. e. 46

BIBLIOTH BODLEIANA
DOMINUS ILLUMINATIO MEA

PREFACE.

The Author and inventor of "The Ocean Marine Signal Telegraph," is prepared to furnish and supply the Naval and Commercial Marine of the world, with the most improved means for signal telegraphing.

It consists in the use of flags for day, and lights at night, which are simple and efficient in their arrangement, embracing the best distinguishing colors, of strong contrasts, that, upon all occasions, and under all circumstances, at the greatest possible distance, the flags can be seen by day, or the lights at night; they are distinct, and distinguishable one from the other.

The system, and arrangement is pronounced the most perfect and efficient means for signal telegraphing ever heretofore offered; and all who go down upon the sea in ships, to do business on great waters, should supply themselves with complete sets, as a means to make themselves known to others around them, that, distress may be made known; assistance rendered; danger avoided; or an enquiry made with perfect clearness and despatch:—The principal Light Houses should be provided with sets, that passing ships might communicate with the shore, whereby important information might be exchanged for public good, on land and sea.

Armies can use this arrangement to advantage on the field of action, for indicating important orders, or information, over the enemies' lines and camp.

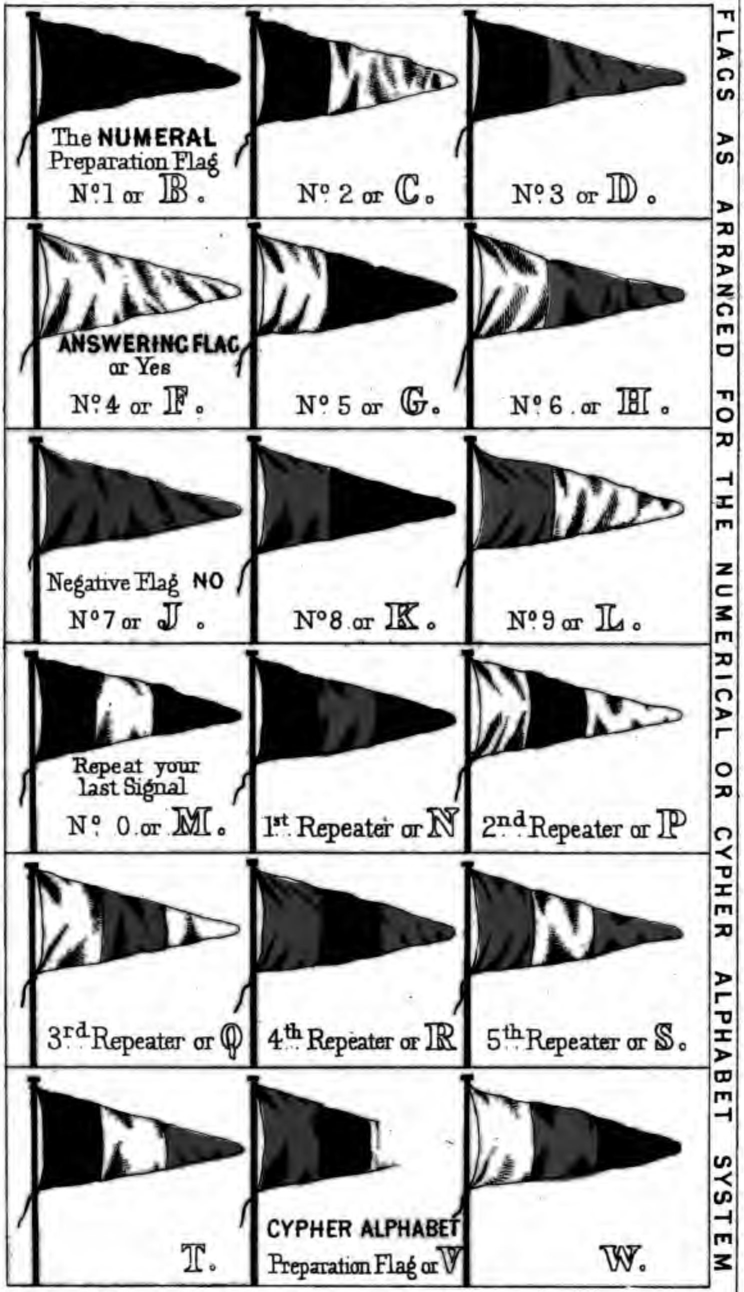
When necessary, these Lanterns may be triced up to mast-head, and worked from the deck or round-top, from which elevated position, signal indications can be maintained in the midst of shipping, with all their sails set. The arrangement for making the necessary changes, are simple, and ordinary persons obtain a mastery of it in a few hours' practice.

The accompanying illustrations, and instructions will set forth the usefulness of this system, and establish a relative value for each flag, with its distinct signification defined for signal purposes, either separately, or with others of the series for indicating sentences in the various Code-books by different authors:—Likewise the changes effected with the Lanterns for indicating the numerals, letters of the alphabet, or one-hoist-signals.

As Signal Telegraphs do not record their messages; hence, the reason; Why? The signal should remain unchanged, till seen; understood; and answered.

PLATE 1.

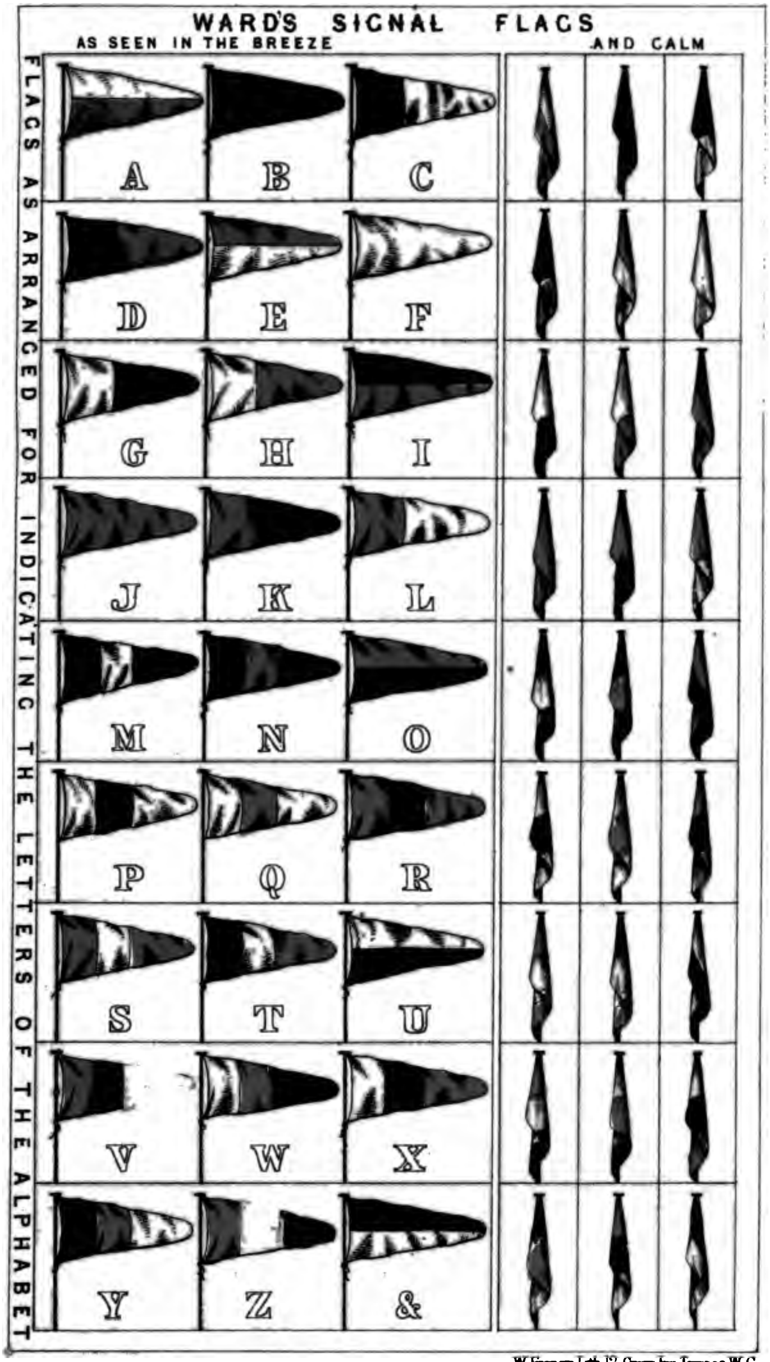
WARD'S SIGNAL FLAGS as seen in the BREEZE.



W.H. Ward Sc. Ent. Sta. Hall. Jany 1860. W. Francis Lith. 12. Grays Inn Terrace London W.C.

THE FLAGS AND SYSTEM ARE SECURED BY ROYAL LETTERS

PLATE 2


WARD'S SIGNAL FLAGS
AS SEEN IN THE BREEZE
AND CALM
FLAGS AS ARRANGED FOR INDICATING THE LETTERS OF THE ALPHABET
A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q
R
S
T
U
V
W
X
Y
Z
&

W. Francis Lith. 12 Grays Inn Terrace, W.C.
London

PATENT IN GREAT BRITAIN AND OTHER COUNTRIES

INSTRUCTIONS

FOR USING

The "Flags" for Day Signals.

Which, are made in form and color, as set forth in the accompanying *plates*, from *registered bunting*, with a *metallic royalty stamp* affixed to each flag respectively, and used in manner following:—

The Black Flag, when hoisted alone, intimates the making of a signal by the numerical system. To indicate the individuality of the code-book, hoist with it, the national or other indicative flag.—*See plate* 1.

The Red, Black, and Orange-Flag, hoisted alone, intimates a signal by the cypher-alphabet, or commercial code of signals.

The Orange-Flag, when hoisted alone, intimates an answer in the affirmative, or YES.

The Red-Flag, hoisted alone, is an answer in the negative, or NO.

The Black, Orange, and Black-Flag, hoisted alone, signifies a desire to have the signal repeated to others, and so on; but if hoisted by the receivers, intimates a desire to have the makers repeat their *Signal*.

The Black and Red-Flag, when displayed alone, indicates *distress*, and should be heeded accordingly.

The advantages that these Flags possess, is, that they are composed of few colors, of strong contrasts, with an equal division of color in each flag (when there is more than one color), thereby allotting an equal area of space to each color in the same flag respectively, whereby the distance the flag can be seen, and clearly distinguished, is much greater than it would be, provided it was composed of many colors, or symbols of small area, and the advantage of being distinguished in all positions seen, whether extended by the breeze, or drooping in a calm.

The "Flags" are simple and efficient, embracing but three colors, that present the strongest contrasts with each other, white sails, and the horizon. *White* and *Blue* are excluded in consequence of their indistinctness when displayed in front of *white clouds or sails*, and a clear blue *horizon*.

These flags as illustrated are twenty-seven in number, thereby furnishing a representative for indicating each letter of the English alphabet respectively, including the character, "*and*." They are also arranged for indicating the numerals, by hoisting one of their number as *indicative*.

The flags that indicate *vowels* are changeable; viz.:—reverse the one indicating "A," and it indicates "E," "wh*e*r*e*by," such words are "sp*e*ll*e*d" as "th*e*s*e*," th*e*r*e*by," etc.: reverse them, and they indicate two "A's," the same with the "I" "O" "U" and "&" flags, each one of which has two significations.

By a reference to these flags, it will be seen, that, they are well adapted for spelling, as, the flags that indicate *vowels*, have their colors divided longitudinally, that whenever one or more of them are displayed in a signal, it indicates "*spell*," itself indicating one of the letters without a separate indicative flag for that purpose.

The flag indicating the character "*and*" when displayed uppermost (in a signal) is "*and*" exclusive of the signal that follows it, although bent on the same halyards; but, when displayed in a signal, otherwise than uppermost, it serves as a *repeater* for the vowel flag before it, as in "B*oo*k," "wh*e*r*e*," etc.

For repeating the *consonant letters*, use any long narrow flag convenient, that is neither national, or signal:—as, in "spe*ll*, "wi*ll*," "le*tt*er," etc.," But when a word begins with a consonant letter that occurs again in the same word; use the ship's *National flag*, to repeat it, as in "*Report*," "*George*," etc. But when words occur that have three consonant letters, as in "*Blubber*," all may be indicated, by using the national flag for (indicating) the letter "B" in its proper place, which is followed by the narrow repeating flag, as, in "Spe*ll*."

Long words may be abreviated; example, "*embk'd*" for "*embarked*," "*Cmd'r*." for "*Commander*," "*Com'd*." for "*Commodore*, "*wk'd*." for "*worked*," by leaving the space of one flag in the signal vacant, which answers for an *apostrophe*, intimating the word is abreviated. The same will answer with the *Lights* at night, by briefly screening them, while spelling where the *apostrophe* should be, indicating it, as, an *abreviated word*, which would soon be familiar to the operators and signalmen, who, would arrange them to suit themselves.

When two, three, or four words are indicated at once, let one word compose a signal, displayed so as to read from stem to stern, such as "*send-a-Bo-t*," for one signal, "*and-some-help*," for another, by displaying one word at each mast-head, and so on, without a code-book, or its equivalent.

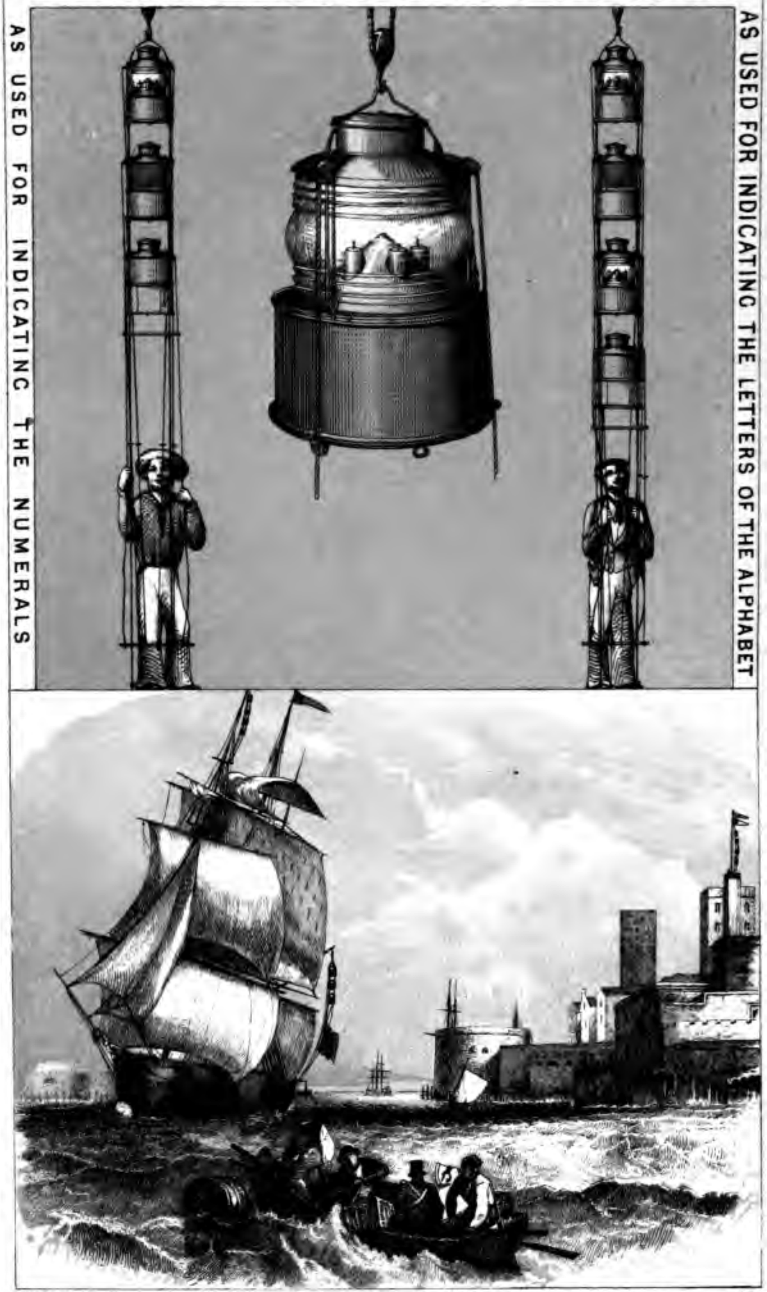
For day signals, "*flags*" appear to be the established result, after a thousand years, or more, of practical use; altho' many other devices have been submitted such as *Balls-Drums-Cones*, etc., either of which, to be of any service, require to be of large size, and occupy valuable space. To overcome which, they are made in pieces, to fit into each other. But, for use, they must be open, when they are liable to become bruised and bent, by thumps against the spars, masts and rigging, or, carrying away the halyards in consequence of their resistance to the wind; while the flags are compact, and may be run-up unbroken, that when displayed, their only resistance, is, the wind on their sides in a longitudinal direction.

Another advantage possessed by these flags is, that their original cost is less, as, their division of color being equal, the material from which they are cut may be laid out in several thicknesses of their respective colors in equal number, and cut through the whole at once, then, by reversing one half, and laying it on top of the other, the cross-cutting may be performed, when, the pieces will be found to fit, and answer the purpose intended.

The advantage gained by spelling sentences, is, the correctness arrived at, when in haste, as the spelling of a word makes it self-correcting and save reference; while by the indicative system, the mistaking of any one flag might lead to serious consequences.

PLATE III.

LANTERNS FOR WARDS NIGHT SIGNAL TELEGRAPH.


AS USED FOR INDICATING THE NUMERALS
AS USED FOR INDICATING THE LETTERS OF THE ALPHABET

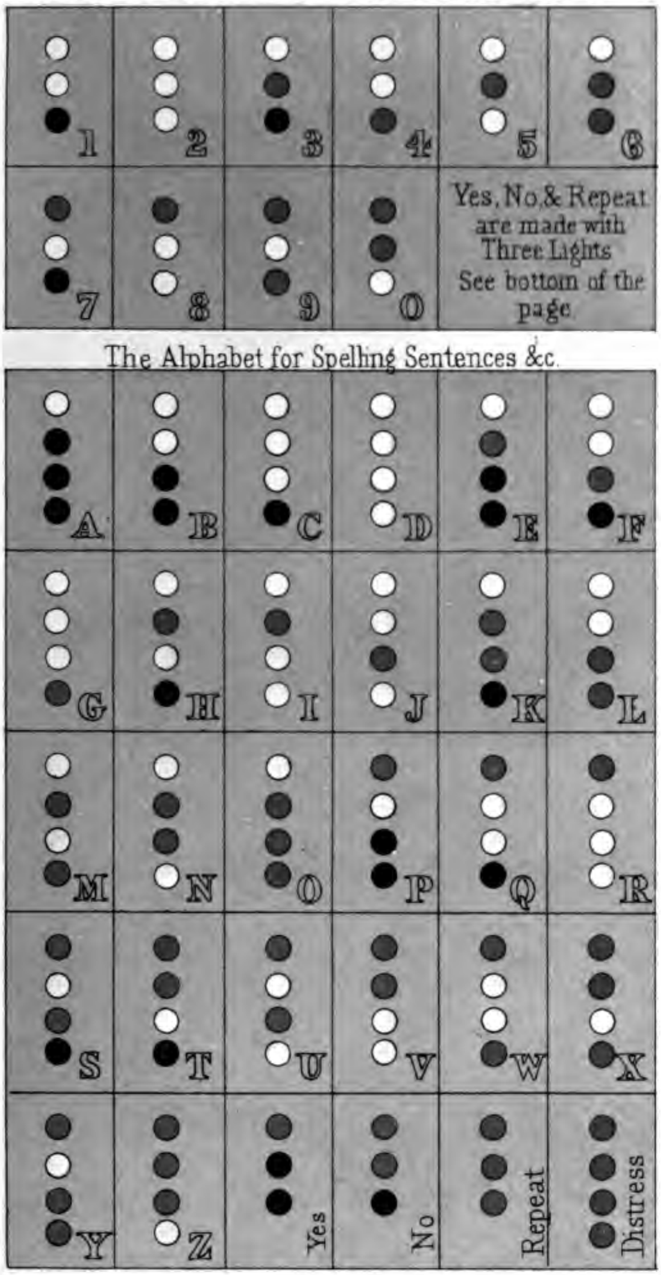
W. H. Ward. Sc. Ent. Sta. Hall. Jan. 1860. W. Francis Lith. 12 Grays Inn Terrace W.C. London.

LANTERNS - PATENTED IN GREAT BRITAIN & OTHER COUNTRIES.

J & A RIDSDALE. MAKERS –
J. D. B. CURTIS. AGENT –
W. H. WARD. PATENTEE

PLATE IV.

WARD'S NIGHT SIGNAL TELEGRAPH


1
2
3
4
5
6
7
8
9
0
Yes, No & Repeat are made with Three Lights See bottom of the page
The Alphabet for Spelling Sentences &c.
A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q
R
S
T
U
V
W
X
Y
Z
Yes
No
Repeat
Distress

W.H.Ward Sc. Ent. Sta. Hall. Jan. 1860 W Francis Lith 12 Grays Inn Terrace W.C. London.

SYSTEM—PATENTED IN GREAT BRITAIN & OTHER COUNTRIES.

54. MINORIES. LONDON. E.
6, BOULEVART POISSONIÉRE, PARIS, FRANCE.
AUBURN. NEW YORK. UNITED STATES.

INSTRUCTIONS

FOR USING

The "Lights" for Night Signals.

◆

Signal LIGHTS, when made to effect their own change, or any arrangement wherein it becomes necessary to see the changing, or screening of any of the lights to understand the signal, are objectionable, as some of the changes may pass unnoticed by the most observing—or by lights of fixed-colors, as a change of position is necessary to complete the signal—or by two or more lights in a horizontal line, as their separate distinctness, is undistinguishable in a longitudinal direction, in either case, the signal, if misunderstood, might lead to consequences the most serious.

The LIGHTS comprising this system overcome these objections, as the changing, coloring, or screening of the lights is, at the will and pleasure of the operator, without a change of position. Each Lantern is provided with powerful lenses to give range to the light, a moveable-red-lenses-envelope to color it; and a moveable-screen-envelope to hide it, which are operated separately, or together, by means of small halyards, and used in manner following:—

For example—Take three of these lanterns and arrange them in a vertical line as shown in plate III.: to call attention, screen all the lights simultaneously, at intervals, till answered in like manner by the signalized parties,—when the operator making the signal will screen his lights two or three times in quick succession, thereby intimating that he will now commence the signal, which he does by screening his lights, and keeps them screened till he is answered by his correspondent's briefly screening his, intimating, that he is awaiting the signal, when the signal operator will expose lights 1 and 2 white, with 3 screened, indicating, (1) that requires to be answered by the receiving operator screening his lights, when, the indications are understood:—the signal operator will now repeat the same process for another (1) that requires answering in like manner, when he will again screen his lights as before, and hoist the red-lenses-envelope to lantern No. 1, and expose the three lights, No, 1 red, with two and three white, indicating (8) which, when answered, may be repeated for another (8) or any other indicative number required.

To prevent mistakes of any kind, never change the color, or screen a light (while signalling) with the lights exposed; but, make all necessary changes while the lights are screened; *that when the lights are exhibited, they will indicate the intended signal;*—when the indications are concluded, corresponding to the order, message, etc., screen all the lights permanently, that, your correspondent may know you have finished. For answer, *vice versa.*

With the use of four of these Lanterns, combinations are formed, indicating the letters of the alphabet. The fourth may be hoisted with the three while indicating the numerals, by keeping it screened till required. When spelling sentences, the signal operator should screen his lights, simultaneously, two or three times, in rapid succession, at the end of each word, to enable the receiving operator to understand them.

The following useful and important indications are made, viz.—*one-red-light* of itself intimates an answer in the affirmative, YES;—*two-red-lights*, the negative or NO;—and three *red-lights*, signifies a desire tohave the signal repeated to others, and so on. But when shown by the receiving operator, intimates a desire for the signal operator to repeat his signal. *Four-red-lights* is a standing signal for DISTRESS.

This system is so well adapted for spelling, that good operators would prefer it to code-books for maintaining continuous communications.

The following Tables will serve to illustrate the indications, without reference to the Plates:—

To indicate the numerals, use three Lanterns, thus (1)
(2)
(3)

Lights, 1 and 2 white, with 3 screened	indicates	1
— 1, 2 and 3 white	„	2
— 1 white, 2 red, and 3 screened	„	3
— 1 and 2 white, with 3 red	„	4
— 1 white, 2 red, and 3 white	„	5
— 1 white, with 2 and 3 red	„	6
— 1 red, 2 white, and 3 screened	„	7
— 1 red, with 2 and 3 white	„	8
— 1 red, 2 white, and 3 red	„	9
— 1 and 2 red, with 3 white	„	0

To indicate the letters of the Alphabet, use four of these Lanterns } thus: (1)
(2)
(3)
(4)

Lights, 1 white, with 2, 3 and 4 screened	indicates	A
— 1 and 2 white, with 3 and 4 screened	„	B
— 1, 2 and 3 white, with 4 screened	„	C
— 1, 2, 3 and 4 white	„	D
— 1 white, 2 red, with 3 and 4 screened	„	E
— 1 and 2 white, with 3 red and 4 screened	„	F
— 1, 2 and 3 white, with 4 red	„	G
— 1 white, 2 red, 3 white, with 4 screened	„	H
— 1 white, 2 red, with 3 and 4 white	„	I
— 1 and 2 white, with 3 red and 4 white	„	J
— 1 white, 2 and 3 red, with 4 screened	„	K
— 1 and 2 white, with 3 and 4 red	„	L
— 1 white, 2 red, 3 white, and 4 red	„	M
— 1 white, 2 and 3 red, with 4 white	„	N
— 1 white, with 2, 3, and 4 red	„	O
— 1 red, 2 white, with 3 and 4 screened	„	P
— 1 red, 2 and 3 white, with 4 screened	„	Q
— 1 red, with 2, 3, and 4 white	„	R
— 1 red, 2 white, 3 red, and 4 screened	„	S
— 1 and 2 red, with 3 white, and 4 screened	„	T
— 1 red, 2 white, 3 red, and 4 white	„	U
— 1 and 2 red, with 3 and 4 white	„	V
— 1 red, 2 and 3 white, with 4 red	„	W
— 1 and 2 red, with 3 white and 4 red	„	X
— 1 red, 2 white, 3 and 4 red	„	Y
— 1, 2 and 3 red with 4 white	„	Z

— 1, 2, 3 and 4 red is a signal for **Distress.**

For Signal Telegraphing, the most simple and sure method should be adopted, and "*Letters*" substituted for "*numerals,*" for indicating sentences in code-books, in consequence of the great number of changes effected in classes of *two, three,* and *four* letters each, without a repetition of any one letter in the same reference indication as set forth in the commercial code of signals, published, by Authority of the British Board of Trade. By excluding the vowels, the number of changes are 152, 038 as follows, of two letters each, 418 with the words "By" and "My" excluded;—of three letters each, 7980. and of four letters each, 143, 640, which, may be divided into classes. The *first* class of 418 should embrace important sentences that frequently occur. The *Second* class of 7980, to include sentences of secondary importance; and the *third* class to form a vocabulary of words of five letters and upwards each, alphabetically arranged by themselves; of Sea-port towns in like order by themselves; of degrees of Latitude and Longitude in like order by themselves; of Capes, Rivers, Islands and Light-Houses, in like order by themselves; of Ships, Names or Numbers, in like order by themselves; also men's names with a number of blank spaces left at intervals for subsequent use, as occasion may require.

By the foregoing, it will be seen, that, excluding the vowels, reduces the changes. But the fact, is not the case, as, the reduction is more than made up by spelling out short words. For example, when at Sea, the words "Go" "On" were signalled. The operator desired to spell them, but was informed by the Admiral that, "*it would not do, as the receiver would not know what was intended,*" consequently it took *six indications* to signify *four letters,* besides the time in looking them up in the *vocabulary.* By excluding all words of, and under *four letters* each; (except in sentences) its bulk and matter is more concise, while each word is spelled in less time than it takes to indicate it. By using all the letters of the alphabet, 676 changes are made with two letters each, 17,576 of three letters each, and 456, 976 of four letters each, making a total of 475,228. But, exclude the vowels, and this number is reduced to 204,183, leaving 271,045 words, in each of which, is, one or more vowels, thereby exceeding the number of changes intended for the code-book by 119,007, or nearly double.

The lights of this system are simple, and very efficient, embracing *white* and *red lights,* being the only reliable contrasts for signal purposes. In *fogs* or *smoke, white* lights present a yellowish appearance, while the red light becomes deeper in color, and with little or no difference in its per-centage of range, thereby keeping the contrasts distinct and intelligible, and are arranged for indicating the numerals, letters of the alphabet, and one-hoist-signals, the latter is useful for Naval Ships, and lines of steamers to communicate with each other, each signal having its own signification, known to themselves respectively. The arrangement for indicating the numerals, and letters of the alphabet are used for general signals, news, etc., as set forth in the *example* of instructions, that, whenever and wherever displayed, all who see and have a card or pamphlet key, may understand the significations indicated by the telegraphic operator. But should it be desirable at any time to exhibit a signal in any one direction, or to a given party, invisible to others, in opposite directions, such signal should be displayed in front of a sail, or its equivalent.

The ONE-HOIST-SIGNALS, effected by the use of six of these Lanterns for commanding a Fleet, or Squadron by night, are very beautiful, and exceedingly efficient; as, by them, *two hundred, separate, distinct, changes, or signals are made* without any other outside means, or device whatever,—besides, they are much smaller in size, and lighter in weight, than the common signal-lantern now in use, with the advantage of always being displayed in a vertical line; thereby, avoiding the possibility of the signal being mistook, as might be, were they arranged horizontally.

The "one-hoist-signals" should be arranged in classes, as follows:—

The 1st Class,	comprise the changes for indicating the letters of the alphabet, and are in number	26
„ 2nd „	Are the same, including the significations for "Yes," "No," "Repeat," and "Distress," and are designated by an additional *white-light at mast-head*, thereby making an additional	30
„ 3rd „	Are the latter repeated with the *mast-head light red*, for other	30
„ 4th „	Are the same, with *two white lights at mast-head* . „	30
„ 5th „	Are the same, with one white and one red light at mast-head . . . . „	30
„ 6th „	Are the same with the mast-head lights *reversed* „	30
„ 7th „	Are the same with both the mast-head lights *red* . „	30
	Making	206

Signals.—But, exclude the six changes that would correspond with the mast-head-lights, (one in each of the latter six classes), and the number is reduced to two hundred,—still, leaving the indications for "*Yes,*" "*No,*" "*Repeat,*" and "*Distress,*" to represent those words respectively;—as, they are not used for any other purpose, except, in connection with a *mast-head light*, when, their signification is changed,—all of which, are made without the use of the working lines, and can be displayed from any desirable part of the ship, without disturbing any sail whatever, or causing the least alarm, or confusion, and are, a decided desideratum, for steam-ship, and naval service, in addition to their practical use for signal telegraphing any subject; on sea or land.

The great advantage possessed by this arrangement of lanterns is, their simplicity of construction, compactness, strength, durability, and universal adaptation to existing Code-Books in use, of whatever language, government or nation, and practical without any code whatever, for holding continuous communications of any length; on any subject, and are furnished in sets, from *Twenty pounds sterling*, while the cost for maintaining continuous communications does not exceed *One shilling per hour*, for the smaller sizes; with a standing signal for distress, that is worth more to the distressed mariner in time of need, than all the night signals in use put together, and should, of itself, be a sufficient inducement, for all careful seamen, to provide themselves with a set:—The exterior dimensions of the cases that contain full sets are 22 inches square for No. *ones*', 18 inches square for No. *twos*' 15 inches square for No. *threes*', and 12 inches square for No. *fours*'.

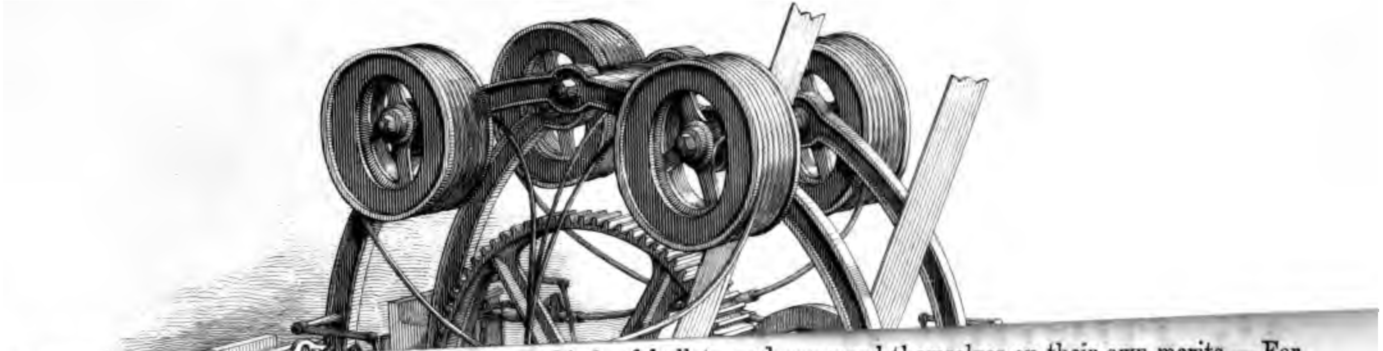
This system has been successfully tested under the most unfavorable circumstances on board Her Majesty's Ships composing the Channel Fleet at sea and proved highly satisfactory to Officers and Signalmen;—also by the New York Chamber of Commerce, and Boards of Trade in the United States.—By Naval and Military Officers and the Public.—By sea-faring Captains and Commanders.—By Pilots and Underwriters.—By practical Men of Science, and the press generally.—In fact, it commends itself, on its own merits, as the desideratum of the seas; and is, what it purports to be,—"THE OCEAN MARINE TELEGRAPH."

WARD'S IMPROVED PATENT BULLET MACHINE,

FOR

MAKING HOLLOW, ELONGATED, RIBBED-BASE, CONICAL-POINTED, AND OTHER BULLETS, BY COMPRESSION,

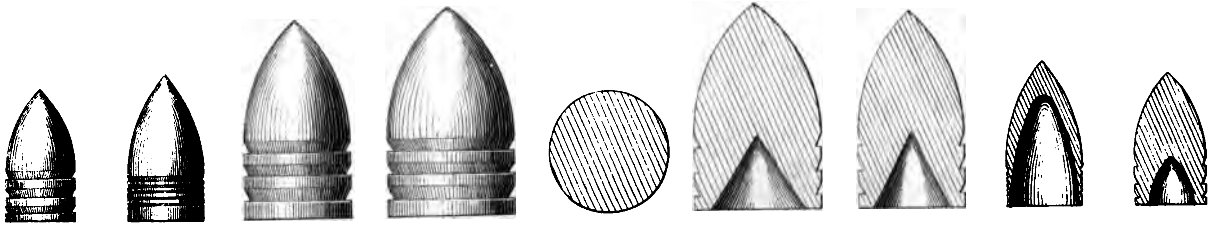
AND CAPABLE OF MAKING SIX THOUSAND (BULLETS) PER HOUR.



These machines are capable of producing different kinds of bullets, and commend themselves on their own merits.—For particulars address the undersigned, Auburn, New York, United States of America,

W. H. WARD.

THE FOLLOWING REPRESENT FULL SIZED SPECIMENS OF BULLETS MADE BY THIS MACHINE.



W Francis lith. 12, Grays Inn Terrace London. W. C.

FOURTH EDITION

OF

WARD'S
OCEAN MARINE TELEGRAPH,

Illustrated.

BY
WILLIAM HENRY WARD,
INVENTOR AND PATENTEE.

LONDON:
PUBLISHED BY THE AUTHOR.
1861.

Entered at Sationers' Hall, January, 1860.

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231. e. 46.

2

INSTRUCTIONS

FOR USING

The "Lights" for Night Signals.

Signal LIGHTS, when made to effect their own change, or any arrangement wherein it is necessary to see the changing, or screening of any one or more of the lights to understand the signal, are objectionable, as some of the changes may pass unnoticed by the most observing—or by lights of fixed-colors, as a change of position is necessary to complete the signal—or by two or more lights in a horizontal line, as their separate distinctness, is undistinguishable in a longitudinal direction, in either case, the signal, if misunderstood, might lead to consequences the most serious.

The LIGHTS that comprise this system overcome these objections, as the changing, coloring, or screening of the lights, is at the will and pleasure of the operator, without a change of position. Each Lantern is provided with powerful lenses to give range to the light, a moveable-red-lenses-envelope to color it; and a moveable-screen-envelope to hide it, which are operated separately, or together, by means of small halyards, and used in manner following:—

For example—Take three of these lanterns and arrange them in a vertical line as shown in the left of plate II. To call attention, screen all the lights simultaneously, at intervals, till answered in like manner by the signalized parties,—when the operator making the signal will screen his lights two or three times in quick succession, thereby intimating that he will now commence the signal, which he does by screening his lights, (and keeps them screened) till he is answered by his correspondent's briefly screening his, intimating, that he is awaiting the signal, when the signal operator will expose lights 1 and 2 white, with 3 screened, [indicating, (1) that requires to be answered by the receiving operator screening his lights, when—the indications are understood:—the signal operator will now repeat the same process for another (1) that requires answering in like manner, when he will again screen his lights as before, and hoist the red-lenses-envelope to lantern No. 1, and expose the three lights, No. 1 red, with two and three white, indicating (8) which, when answered, may be repeated for another (8) or any other indicative number required.

To prevent mistakes of any kind, never change the color, or screen a light (while signalling) with the lights exposed; but, make all necessary changes while the lights are screened; ***that when the lights are exhibited, they will indicate the intended signal***;—when the indications are concluded, corresponding to the order, message, etc., screen all the lights permanently, that, your correspondent may know you have finished. For answer, ***vice versa***.

With the use of four of these Lanterns, combinations are formed, indicating the letters of the alphabet. The fourth may be hoisted with the three while indicating the numerals, by keeping it screened till required. When spelling sentences, the signal operator should screen his lights, simultaneously, two or three times, in rapid succession, at the end of each word, to enable the receiving operator to understand them.

The following useful and important indications are made, viz.—***one-red-light*** of itself intimates an answer in the affirmative, YES;—*two-red-lights*, the negative or NO;—and ***three-red-lights***, signifies a desire to have the signal repeated to others, and so on. But when shown by the receiving operator, intimates a desire for the signal operator to repeat his signal. ***Four-red-lights*** is a standing signal for DISTRESS.

This system is so well adapted for spelling, that good operators would prefer it to code-books for maintaining continuous communications.

The following Tables will serve to illustrate the indications, without reference to the Plates—and should be committed to memory:—

To indicate the numerals, use three lanterns, thus
(1)
(2)
(3)

Lights, 1 and 2 white, with 3 screened	indicates	**1**
— 1, 2 and 3 white	„	**2**
— 1 white, 2 red, and 3 screened..	„	**3**
— 1 and 2 white, with 3 red	„	**4**
— 1 white, 2 red, and 3 white	„	**5**
— 1 white, with 2 and 3 red	„	**6**
— 1 red, 2 white, and 3 screened...	„	**7**
— 1 red, with 2 and 3 white	„	**8**
— 1 red, 2 white, and 3 red	„	**9**
— 1 and 2 red, with 3 white	„	**0**

To indicate the letters of the Alphabet, use four of these Lanterns thus:
(1)
(2)
(3)
(4)

Lights, 1 white, with 2, 3 and 4 screened	indicates	**A**
— 1 and 2 white, with 3 and 4 screened...	„	**B**
— 1, 2 and 3 white, with 4 screened	„	**C**
— 1, 2, 3 and 4 white	„	**D**
— 1 white, 2 red, with 3 and 4 screened...	„	**E**
— 1 and 2 white, with 3 red, and 4 screened	„	**F**
— 1, 2 and 3 white, with 4 red	„	**G**
— 1 white, 2 red, 3 white, with 4 screened	„	**H**
— 1 white, 2 red, with 3 and 4 white	„	**I**
— 1 and 2 white, with 3 red, and 4 white	„	**J**
— 1 white, 2 and 3 red, with 4 screened	„	**K**
— 1 and 2 white, with 3 and 4 red	„	**L**
— 1 white, 2 red, 3 white, and 4 red	„	**M**
— 1 white, 2 and 3 red, with 4 white	„	**N**
— 1 white, with 2, 3 and 4 red	„	**O**
— 1 red, 2 white, with 3 and 4 screened...	„	**P**
— 1 red, 2 and 3 white, with 4 screened...	„	**Q**
— 1 red, with 2, 3 and 4 white	„	**R**
— 1 red, 2 white, 3 red, and 4 screened...	„	**S**
— 1 and 2 red, with 3 white, and 4 screened	„	**T**
— 1 red, 2 white, 3 red, and 4 white	„	**U**
— 1 and 2 red, with 3 and 4 white	„	**V**
— 1 red, 2 and 3 white, with 4 red	„	**W**
— 1 and 2 red, with 3 white and 4 red	„	**X**
— 1 red, 2 white, 3 and 4 red	„	**Y**
— 1, 2 and 3 red, with 4 white	„	**Z**

— 1, 2, 3 and 4 red is a signal for **Distress**.

NOTE.—The foregoing forms a system, viz.—From A to O, inclusive the top light is *White;* and from P to Z inclusive *red.*

This system is so well adapted for spelling, that good operators would prefer it to code-books for maintaining continuous communications.

The following Tables will serve to illustrate the indications, without reference to the Plates—and should be committed to memory:—

To indicate the numerals, use three lanterns, thus (1) (2) (3)

Lights, 1 and 2 white, with 3 screened ... ... indicates **1**
— 1, 2 and 3 white ... ... " **2**
— 1 white, 2 red, and 3 screened.. ... ... " **3**
— 1 and 2 white, with 3 red ... ... " **4**
— 1 white, 2 red, and 3 white ... ... " **5**
— 1 white, with 2 and 3 red ... ... " **6**
— 1 red, 2 white, and 3 screened... ... ... " **7**
— 1 red, with 2 and 3 white ... ... " **8**
— 1 red, 2 white, and 3 red ... ... " **9**
— 1 and 2 red, with 3 white ... ... " **0**

To indicate the letters of the Alphabet, use four of these Lanterns ... ... } thus: (1) (2) (3) (4)

Lights, 1 white, with 2, 3 and 4 screened ... ... indicates **A**
— 1 and 2 white, with 3 and 4 screened... ... " **B**
— 1, 2 and 3 white, with 4 screened ... ... " **C**
— 1, 2, 3 and 4 white ... ... " **D**
— 1 white, 2 red, with 3 and 4 screened... ... " **E**
— 1 and 2 white, with 3 red, and 4 screened ... " **F**
— 1, 2 and 3 white, with 4 red ... ... " **G**
— 1 white, 2 red, 3 white, with 4 screened ... " **H**
— 1 white, 2 red, with 3 and 4 white ... ... " **I**
— 1 and 2 white, with 3 red, and 4 white ... " **J**
— 1 white, 2 and 3 red, with 4 screened ... " **K**
— 1 and 2 white, with 3 and 4 red ... ... " **L**
— 1 white, 2 red, 3 white, and 4 red ... ... " **M**
— 1 white, 2 and 3 red, with 4 white ... ... " **N**
— 1 white, with 2, 3 and 4 red .. .. " **O**
— 1 red, 2 white, with 3 and 4 screened... ... " **P**
— 1 red, 2 and 3 white, with 4 screened... ... " **Q**
— 1 red, with 2, 3 and 4 white ... ... " **R**
— 1 red, 2 white, 3 red, and 4 screened ... ... " **S**
— 1 and 2 red, with 3 white, and 4 screened ... " **T**
— 1 red, 2 white, 3 red, and 4 white ... ... " **U**
— 1 and 2 red, with 3 and 4 white ... .. " **V**
— 1 red, 2 and 3 white, with 4 red ... ... " **W**
— 1 and 2 red, with 3 white and 4 red ... ... " **X**
— 1 red, 2 white, 3 and 4 red ... ... " **Y**
— 1, 2 and 3 red, with 4 white ... ... " **Z**
— 1, 2, 3 and 4 red is a signal for **Distress.**

NOTE.—The foregoing forms a system, viz.—From A to O, inclusive the top light is *White;* and from P to Z inclusive *red.*

For Signal Telegraphing, the most simple and sure method should be adopted, and "*Letters*" substituted for "*numerals*" to indicate sentences in code-books, owing to the number of changes effected in classes of *two, three,* and *four* letters each, without a repetition of any one letter in the same reference indication as set forth in the commercial code of signals, published, by authority of the British Board of Trade. By excluding the vowels, the number of changes are 152,038, as follows, of two letters each, 418 with the words "By" and "My" excluded;—of three letters each, 7980, and of four letters each, 143,640, which, may be divided into classes. The *first* class to embrace important sentences that frequently occur, and the *second* should include those of secondary importance; while the *third* may form a vocabulary of words of five letters and upwards each, alphabetically arranged by themselves; of sea-port towns in like order by themselves; of degrees of latitude and longitude in like order by themselves; of capes, rivers, islands and light-houses, in like order by themselves; of ships, names or numbers, in like order by themselves; with blank spaces left at intervals for subsequent use.

By excluding the vowels, the number of changes are reduced. But the reduction is more than made up by spelling out short words. For example, when at Sea, the words "GO" "ON" were signalled. The operator desired to to spell them, but was informed by the Admiral that "*it would not do, as the receiver would not know what was intended,*" consequently it took *six indications* to signify *four letters*, besides the time in looking them up in the *vocabulary*. By excluding all words of, and under *four letters* each; (except in sentences) its bulk and matter is more concise, while each word is spelled in less time than it takes to indicate it. By using all the letters of the alphabet, 676 changes are made with two letters each, 17,576 of three letters each, and 456,976 of four letters each, making a total of 475,228, with the vowels excluded this number is reduced to 204,183, leaving 271,045 words, in each of which, is, one or more vowels, thereby exceeding the number of changes intended for the code-book.

The LIGHTS of this system are simple and efficient, embracing *white* and *red*, and are the only reliable contrasts with each other, and darkness for signal purposes at night. In *fogs* or *smoke*, *white* lights present a yellowish appearance, while the *red* becomes deeper in color, with little or no difference in its per-centage of range, thereby keeping the contrasts distinct and intelligible. The arrangement for indicating the numerals, and letters of the alphabet are used for general signals, news, etc., as set forth in the *example* of instructions, that, whenever and wherever displayed, all who see and have a card, or pamphlet key, may understand the significations indicated by the telegraphic operator. But should it be desirable at any time to exhibit a signal in any one direction, or to a given party, invisible to others, in opposite directions, such signal should be displayed in front of a sail, or its equivalent.

The ONE-HOIST-SIGNALS, effected by the use of six of these Lanterns for commanding a Fleet, or Squadron by night, are very beautiful, and exceedingly efficient; as, by them, *two hundred, separate, distinct, changes, or signals are made without any other outside means, or device whatever,* and the advantage of displaying the lights in a vertical line; thereby, avoiding the possibilty of the signal being mistook.

These "one-hoist-signals" are arranged in classes, as follows :—

The 1st Class	to comprise the changes for indicating the letters of the alphabet, and are in number	26
„ 2nd „	Are the same, including the significations for "Yes," "No," "Repeat," and "Distress," and are designated by an additional *white-light at mast-head* making an additional	30
„ 3rd „	Are the latter repeated with the *mast-head light red*, for other	30
„ 4th „	Are the same, with *two white lights at mast-head* . „	30
„ 5th „	Are the same, with one *white* and one *red* light at mast-head	30
„ 6th „	Are the same with the mast-head lights *reversed* . „	30
„ 7th „	Are the same with both the mast-head lights *red* . „	30
	Making	206

SIGNALS.—By excluding the six changes that would correspond with the mast-head-lights, (one in each of the latter six classes), and the number is reduced to two hundred,—still, leaving the indications for "*Yes,*" "*No,*" "*Repeat,*" and "*Distress,*" to represent those words respectively ;—as, they are not used for any other purpose, except, in connection with a *mast-head light* when, their signification is changed,—all of which, are made without the use of the working lines, and can be displayed from any desirable part of the ship, without disturbing any sail whatever, to cause, alarm or confusion.

The great advantage possessed by this arrangement of lanterns is, their simplicity of construction, compactness, strength, durability, and universal adaptation to existing Code-Books in use, of whatever, language, government, or nation,.and practical without any code whatever, for holding continuous communications of any length ; on any subject. They are furnished in sets, from *Twenty five pounds sterling*, while the cost for light does not exceed *two-pence per hour*, for the smaller sizes ; with a standing signal for distress, that is worth more to the distressed mariner in time of need, than all the night signals in use put together, and should, of itself, be a sufficient inducement, for all careful seamen, to provide themselves with them, which are put up in substantial wooden cases, the dimensions of which are 24 inches square for No. *ones*', 21 inches square for No. *twos*,' 18 inches square for No. *threes*', and 15 inches square for No. *fours*'.

* This system has been successfully tested under the most unfavorable circumstances on board Her Majesty's Ships composing the Channel Fleet at sea, and proved highly satisfactory to the Admiral, Officers, and Signalmen ;—also by the New York Chamber of Commerce, and Boards of Trade in the United States.—By Naval and Military Officers and the Public.—By sea-faring Captains and Commanders.—By Pilots and Underwriters.—By practical Men of Science, and the Press generally.—And commends itself, on its own merits, as the desideratum of the seas ; and is, what it purports to be,—"THE OCEAN MARINE TELEGRAPH."

TESTIMONIALS OF COMMENDATION.

New York, June 14th, 1859.

W. H. Ward, Esq.

Sir,—I beg to acknowledge yours of the 10th, and will forward our Report on Marine Signals to your address in London as soon after the Chamber of Commerce meets as I can.

Yours truly,
E. E. MORGAN,
Chairman of Committee on Marine Signals of the New York Chamber of Commerce.

Office, Chamber of Commerce, New York,
July 20th, 1859.

I hereby certify that the annexed Report on "Ward's Ocean Signal Telegraph" was made to the Chamber of Commerce of New York, on the 7th instant, and was accepted, and a copy thereof ordered to be forwarded to Mr. Ward.

J. SMITH HOMANS,
SECRETARY.

To the New York Chamber of Commerce.

Gentlemen,—The undersigned have carefully examined Ward's Ocean Signal Telegraph for sailing and steam vessels, and do not hesitate to say that the Flags are simpler, more easily understood, and less liable to mistake than any that we have seen. The Lanterns are well adapted for the use of naval vessels and for fortifications on the coast, where they might have occasion to signalize vessels or fleets at night.

New York,
June 9th, 1859.

E. E. MORGAN,
C. H. MARSHALL, } COMMITTEE.
F. M. FRENCH,

Office of the Oswego Board of Trade,
Oswego, N.Y., April 27th, 1859.

Resolved, by the Board of Trade of the City of Oswego, that we consider "*Ward's Ocean Signal Telegraph*" worthy of consideration, and hereby recommend it to the favorable consideration of Boards of Trade, and commercial men generally throughout the world.

O. H. HASTINGS,
PRESIDENT.

C. H. STILLMAN, Secretary.

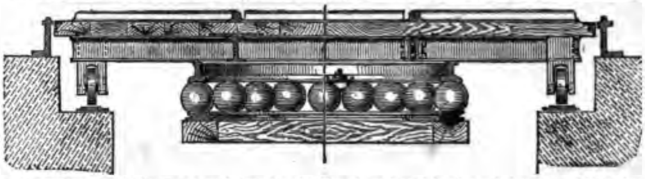
WARD'S FOG SIGNALS. Plate III

SWERING GUNS. | H No | PH No | APH No | APH No | APH No

THE INTERNATIONAL EXHIBITION—1862.

[*From the* MINING JOURNAL, *Oct.* 11.]

SELF-CENTREING TURN-TABLE.—Near the extremity of the eastern annexe, and opposite the elegant saloon railway carriage, which forms so attractive a feature in that locality, Mr. W. H. WARD, of Auburn, New York, exhibits the improved self-centreing turn-table, of which the subjoined is a diagram; and which is certainly one of the most useful contrivances exhibited in connection with railways and railway plant. It will be at once seen that by this arrangement the wear and tear by friction is reduced to the minimum, whilst the supports are so well distributed beneath the entire table that the labour required to turn it, even with the heaviest possible weight, is scarcely worth consideration. The table has neither rubbing journal, wheel, nor central guiding pivot, and we do not see the possibility of its getting out of order, unless by the positive grinding away of the parts, which would take years to effect. The bearing consists of a large annular groove, which takes the form of a segment of a circle, beneath the table, a corresponding annular groove reversed being provided on the foundation below the table. In the lower groove a number of hollow spheres of iron are placed, upon which the platform of the table rests, and on which it turns. The whole is now ready for use, the turning being made upon the globes with an ease that can scarcely be conceived by those accustomed to the ordinary form of table. From the simplicity and durability of the new turn-table, it becomes a question whether it could not be very extensively introduced in collieries, as well as on railways, where a few additional turn-tables might be made to economise both space and money. We understand that Messrs. Lloyds, Fosters, and Co., of the Old Park Ironwork, have one in use at their works, and no doubt when the invention becomes known its adoption will be general.



OF GUNS		
1	3	4
1	4	1
1	4	2
1	4	3
2	4	4
2	1	2
2	1	3
2	1	4
2	2	1
2	2	2
2	2	3
2	2	4
2	3	1
2	3	2
2	3	3
2	3	4
2	4	1
2	4	2
2	4	3
2	4	4
3	1	2
3	1	3
3	1	4
3	2	1
3	2	2
3	2	3
3	2	4
3	3	1
3	3	2
3	3	3
3	3	4
3	4	1
3	4	2
3	4	3
3	4	4
4	1	2
4	1	3
4	1	4
4	2	1
4	2	2
4	2	3
4	2	4
4	3	1
4	3	2
4	3	3
4	3	4
4	4	1
4	4	2
4	4	[illegible]

38	2	3	4	*87*	1	2	4	4	*137*	2	2	3	1	*187*	3	2	1	2	*237*	4	1	
39	2	4	1	*88*	1	3	1	2	*138*	2	2	3	2	*168*	3	2	1	3	*238*	4	1	

Ent. at Sta. Hall

WARD'S FOG SIGNALS.

Plate III

ANSWERING GUNS.

ONE GUN, YES
TWO GUNS, NO
THREE GUNS, REPEAT
FOUR GUNS, DISTRESS

TELEGRAPH No	No OF GUNS		
1	1	2	
2	1	3	
3	1	4	
4	2	1	
5	2	2	
6	2	3	
7	2	4	
8	3	1	
9	3	2	
10	3	3	
11	3	4	
12	4	1	
13	4	2	
14	4	3	
15	4	4	
16	1	2	1
17	1	2	2
18	1	2	3
19	1	2	4
20	1	3	1
21	1	3	2
22	1	3	3
23	1	3	4
24	1	4	1
25	1	4	2
26	1	4	3
27	1	4	4
28	2	1	2
29	2	1	3
30	2	1	4
31	2	2	1
32	2	2	2
33	2	2	3
34	2	2	4
35	2	3	1
36	2	3	2
37	2	3	3
38	2	3	4
39	2	4	1

TELEGRAPH No	No OF GUNS			
40	2	4	2	
41	2	4	3	
42	2	4	4	
43	3	1	2	
44	3	1	3	
45	3	1	4	
46	3	2	1	
47	3	2	2	
48	3	2	3	
49	3	2	4	
50	3	3	1	
51	3	3	2	
52	3	3	3	
53	3	3	4	
54	3	4	1	
55	3	4	2	
56	3	4	3	
57	3	4	4	
58	4	1	2	
59	4	1	3	
60	4	1	4	
61	4	2	1	
62	4	2	2	
63	4	2	3	
64	4	2	4	
65	4	3	1	
66	4	3	2	
67	4	3	3	
68	4	3	4	
69	4	4	1	
70	4	4	2	
71	4	4	3	
72	4	4	4	
73	1	2	1	2
74	1	2	1	3
75	1	2	1	4
76	1	2	2	1
77	1	2	2	2
78	1	2	2	3
79	1	2	2	4
80	1	2	3	1
81	1	2	3	2
82	1	2	3	3
83	1	2	3	4
84	1	2	4	1
85	1	2	4	2
86	1	2	4	3
87	1	2	4	4
88	1	3	1	2

TELEGRAPH No	No OF GUNS			
89	1	3	1	3
90	1	3	1	4
91	1	3	2	1
92	1	3	2	2
93	1	3	2	3
94	1	3	2	4
95	1	3	3	1
96	1	3	3	2
97	1	3	3	3
98	1	3	3	4
99	1	3	4	1
100	1	3	4	2
101	1	3	4	3
102	1	3	4	4
103	1	4	1	2
104	1	4	1	3
105	1	4	1	4
106	1	4	2	1
107	1	4	2	2
108	1	4	2	3
109	1	4	2	4
110	1	4	3	1
111	1	4	3	2
112	1	4	3	3
113	1	4	3	4
114	1	4	4	1
115	1	4	4	2
116	1	4	4	3
117	1	4	4	4
118	2	1	2	1
119	2	1	2	2
120	2	1	2	3
121	2	1	2	4
122	2	1	3	1
123	2	1	3	2
124	2	1	3	3
125	2	1	3	4
126	2	1	4	1
127	2	1	4	2
128	2	1	4	3
129	2	1	4	4
130	2	2	1	2
131	2	2	1	3
132	2	2	1	4
133	2	2	2	1
134	2	2	2	2
135	2	2	2	3
136	2	2	2	4
137	2	2	3	1
138	2	2	3	2

TELEGRAPH No	No OF GUNS			
139	2	2	3	3
140	2	2	3	4
141	2	2	4	1
142	2	2	4	2
143	2	2	4	3
144	2	2	4	4
145	2	3	1	2
146	2	3	1	3
147	2	3	1	4
148	2	3	2	1
149	2	3	2	2
150	2	3	2	3
151	2	3	2	4
152	2	3	3	1
153	2	3	3	2
154	2	3	3	3
155	2	3	3	4
156	2	3	4	1
157	2	3	4	2
158	2	3	4	3
159	2	3	4	4
160	2	4	1	2
161	2	4	1	3
162	2	4	1	4
163	2	4	2	1
164	2	4	2	2
165	2	4	2	3
166	2	4	2	4
167	2	4	3	1
168	2	4	3	2
169	2	4	3	3
170	2	4	3	4
171	2	4	4	1
172	2	4	4	2
173	2	4	4	3
174	2	4	4	4
175	3	1	2	1
176	3	1	2	2
177	3	1	2	3
178	3	1	2	4
179	3	1	3	1
180	3	1	3	2
181	3	1	3	3
182	3	1	3	1
183	3	1	4	1
184	3	1	4	2
185	3	1	4	3
186	3	1	4	4
187	3	2	1	2
188	3	2	1	3

TELEGRAPH No	No OF GUNS			
189	3	2	1	4
190	3	2	2	1
191	3	2	2	2
192	3	2	2	3
193	3	2	2	4
194	3	2	3	1
195	3	2	3	2
196	3	2	3	3
197	3	2	3	4
198	3	2	4	1
199	3	2	4	2
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201	3	2	4	4
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203	3	3	1	3
204	3	3	1	4
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206	3	3	2	2
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208	3	3	2	4
209	3	3	3	1
210	3	3	3	2
211	3	3	3	3
212	3	3	3	4
213	3	3	4	1
214	3	3	4	2
215	3	3	4	3
216	3	3	4	4
217	3	4	1	2
218	3	4	1	3
219	3	4	1	4
220	3	4	2	1
221	3	4	2	2
222	3	4	2	3
223	3	4	2	4
224	3	4	3	1
225	3	4	3	2
226	3	4	3	3
227	3	4	3	4
228	3	4	4	1
229	3	4	4	2
230	3	4	4	3
231	3	4	4	4
232	4	1	2	1
233	4	1	2	2
234	4	1	2	3
235	4	1	2	4
236	4	1	3	1
237	4	1	3	2
238	4	1	3	3

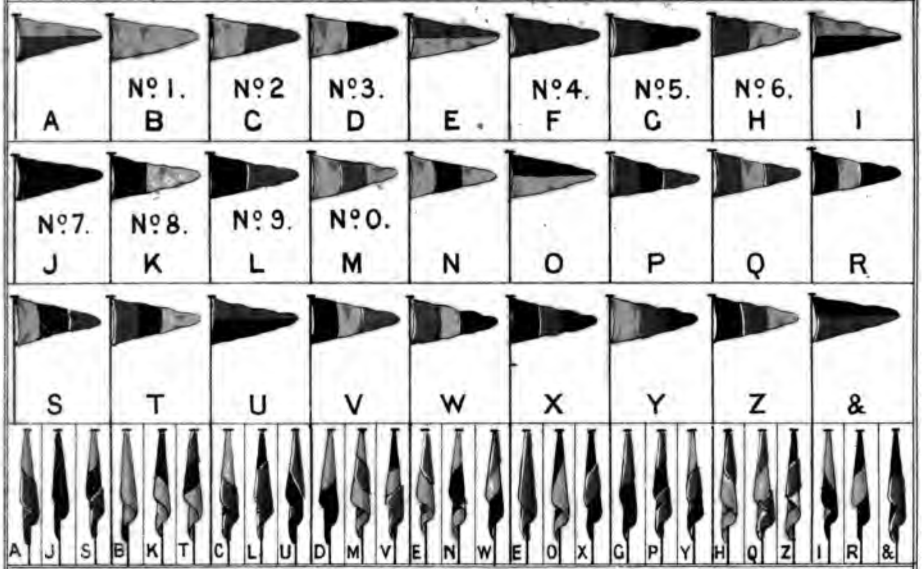
TELEGRAPH No	No OF GUNS			
239	4	1	3	4
240	4	1	4	1
241	4	1	4	2
242	4	1	4	3
243	4	2	4	4
244	4	2	1	2
245	4	2	1	3
246	4	2	1	4
247	4	2	2	1
248	4	2	2	2
249	4	2	2	3
250	4	2	2	4
251	4	2	3	1
252	4	2	3	2
253	4	2	3	3
254	4	2	3	4
255	4	2	4	1
256	4	2	4	2
257	4	2	4	3
258	4	2	4	4
259	4	3	1	2
260	4	3	1	3
261	4	3	1	4
262	4	3	2	1
263	4	3	2	2
264	4	3	2	3
265	4	3	2	4
266	4	3	3	1
267	4	3	3	2
268	4	3	3	3
269	4	3	3	4
270	4	3	4	1
271	4	3	4	2
272	4	3	4	3
273	4	3	4	4
274	4	4	1	2
275	4	4	1	3
276	4	4	1	4
277	4	4	2	1
278	4	4	2	2
279	4	4	2	3
280	4	4	2	4
281	4	4	3	1
282	4	4	3	2
283	4	4	3	3
284	4	4	3	4
285	4	4	4	1
286	4	4	4	2
287	4	4	4	3
288	4	4	4	4

Ent. at Sta. Hall

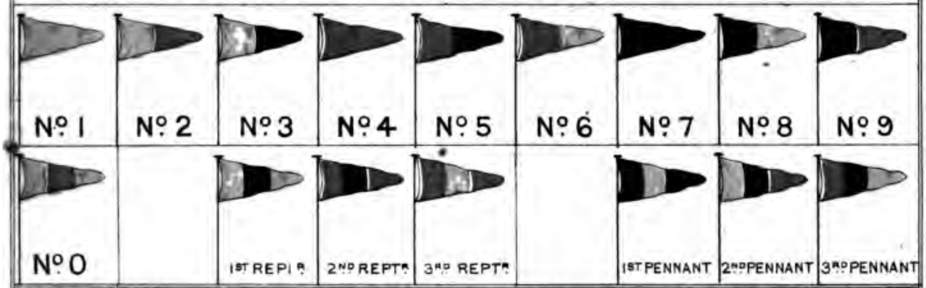
W. Francis lith.

Plate IV.

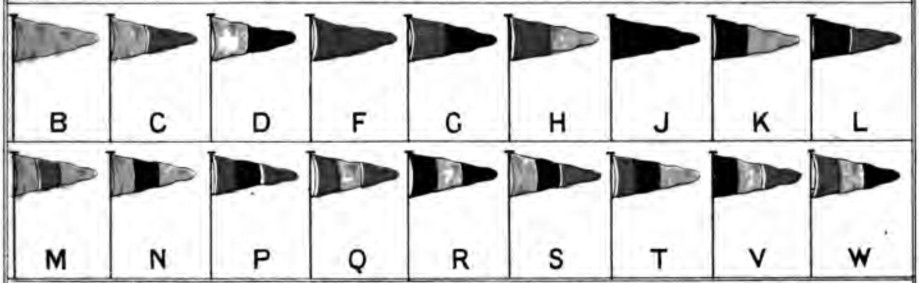
WARD'S SIGNAL FLAGS



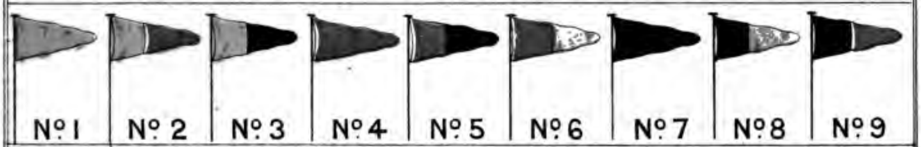
THE FLAGS AS ARRANGED FOR MARRYATT'S CODE OF SIGNALS.



THE FLAGS AS ARRANGED FOR THE COMMERCIAL CODE OF SIGNALS.

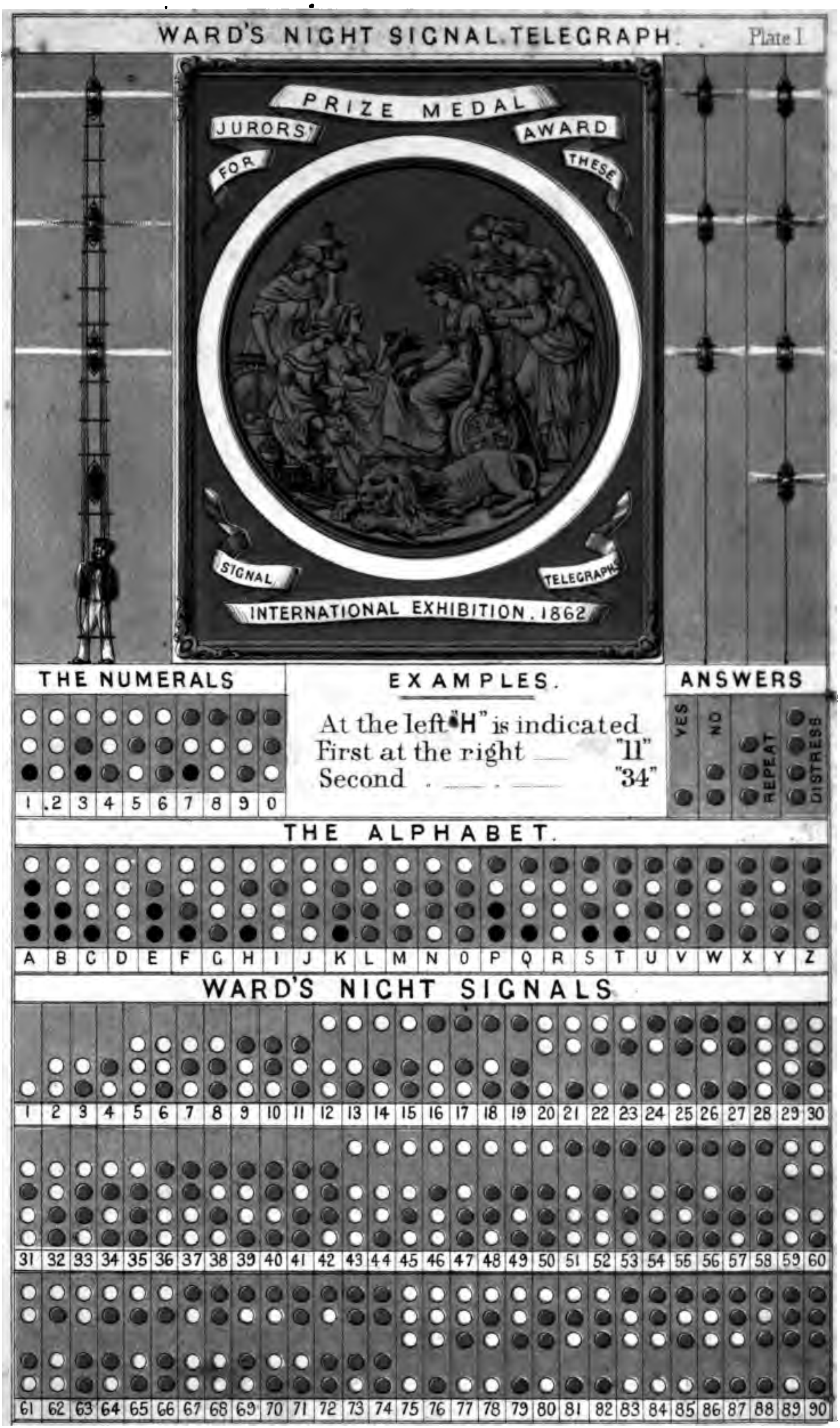


THE FLAGS AS ARRANGED FOR REYNOLDS' CODE OF SIGNALS.



The usual Pennants for indicating the thousands in "Reynolds" Code may be used in connection with these Numeral Flags.

T.H.Ward, del. Ent at Sta Hall



At the left "H" is indicated
First at the right "11"
Second "34"

Ent at Sta Hall

W Francis lith

Royal Mail Steam Ship "America,"
Liverpool, 29th June, 1859.

Charles Mac Iver, Esq.

Dear Sir,—Mr. Ward, the inventor of a new system of Day and Night Signals, came passenger with me in the "America" from Boston this last trip. During the passage I had several opportunities of testing the value and utility of his invention.

I am of opinion that it may be introduced into the Marine Service, and to much practical benefit.

I am, dear Sir, your obedient Servant,
EDWIN R. MOODIE,
MASTER.

Mercantile Marine Service Association,
20, *Water Street, Liverpool, 2nd Dec.,* 1862.

Dear Sir,—I have the pleasure to inform you that at a meeting of the Council of the Mercantile Marine Service Association of Liverpool, held on the 1st instant, Captain B. Sproule in the chair, it was proposed by Captain W. O. Campbell, R.N.R., Deputy-chairman, seconded by Captain H. R. Cumming, and unanimously Resolved—That the best thanks of the Council are due to Mr. W. H. Ward, of Auburn, New York, for his Lecture upon his system of Day, Night, and Fog Signals, and the valuable information given in it to the Members of the Association. That the Council consider the Lights or Night Signals the *most* perfect system yet devised, and to be well adapted for Her Majesty's Navy, for the Mail Service, and for all signalling at night.

Yours faithfully,
BEN. J. THOMSON,
SECRETARY.

W. H. WARD, Esq.
24, Union Square, London, N.

A notice of these *Night Signals* having a place in the introduction, extracted from the *National Intelligencer*, of December 8th, 1856. The subjoined from the *Times*, of December 3rd, 1862, may be interesting as illustrative of progression :—

> "Mr. Ward, of New York, United States of America, who has given his attention in England during the past three years to the improvement of our naval signals as employed at sea, has returned from Liverpool, where he has been engaged in lecturing on the subject of marine telegraphs before the Associated Shipowners' Assembly. He last night displayed his improved signal telegraph, suspended on the flagstaff in Woolwich Dockyard, by special direction of the Lords Commissioners of the Admiralty, Sir F. Nicolson, C.B., the Commodore-Superintendent, and other officers of the yard were present. The improvement consists of a different arrangement of the lanterns, and in the use of five lamps instead of four, as formerly, which are provided with red lenses and dark shades, worked from the deck by means of small work lines. The lamps are triced up as fixtures and are arranged at equal distances in a verticle line, and the operator stands on the deck beneath. The extra lantern gives the advantage of using an additional number of white signals, the latter being distinguished at a greater distance at sea than the red. The trials last night commenced at half-past 4 p.m., and extended over two hours. In order to test the superior brilliancy of the signals one of the old Admiralty lanterns was hauled up the flagstaff, and was pronounced "a mere glimmer" in comparison to the new signals. The efficacy and speed with which the messages were delivered was remarkable, no less than 100 having been recorded under the lapse of 30 minutes. The lanterns were disconnected and exhibited as steering lamps and ordinary signal lanterns."

SEVENTH EDITION

OF

WARD'S

INTERNATIONAL

Prize-Medal Signal Telegraph.

ILLUSTRATED.

LONDON:
W. H. WARD, 24, UNION SQUARE, N.,
AND
AUBURN, NEW YORK, UNITED STATES.

ENTERED AT STATIONERS' HALL,
AND
IN THE COUNTY CLERKS' OFFICE FOR THE NORTHERN DISTRICT OF NEW YORK.

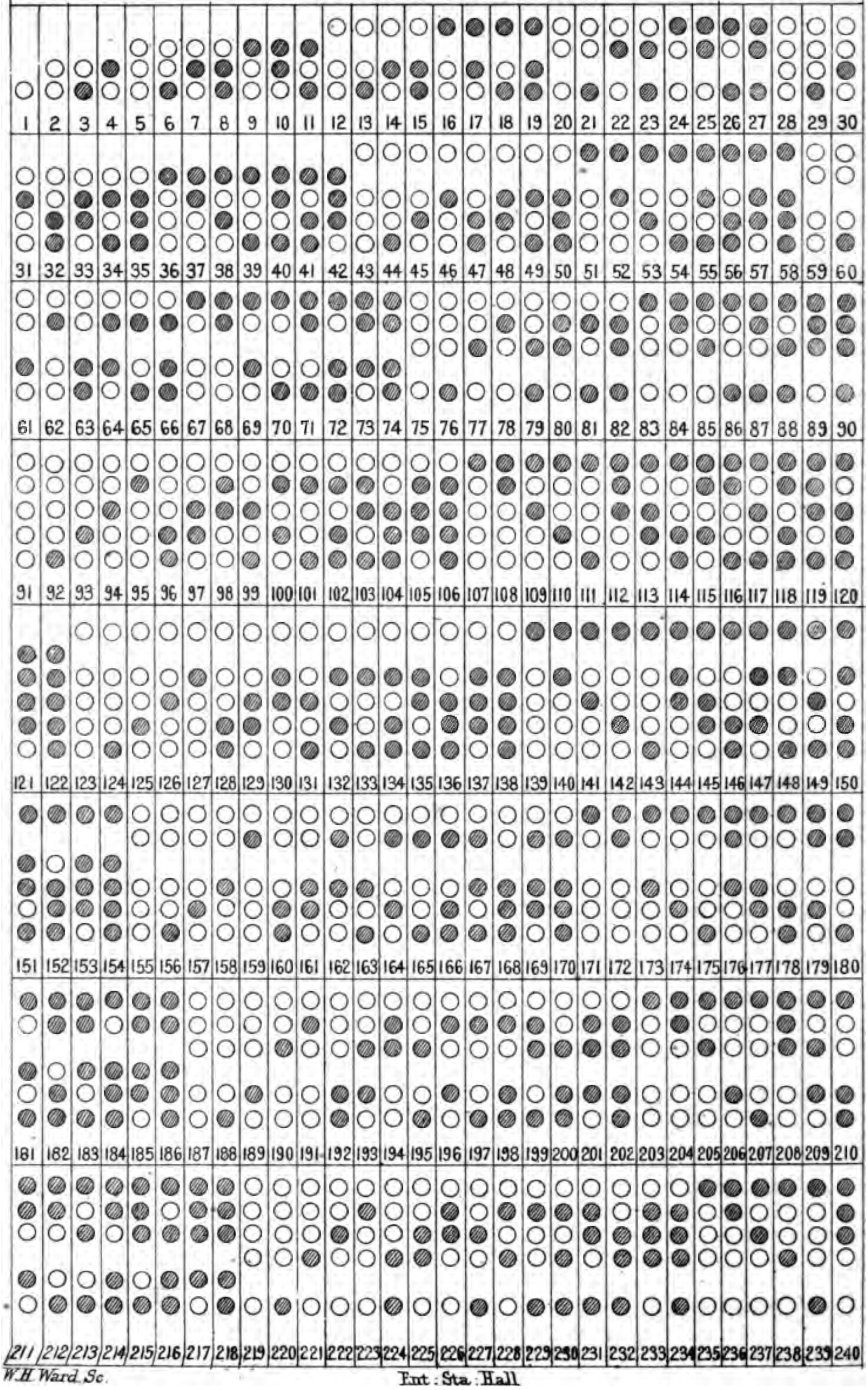
1863.

~~200. f. 48~~

4

Plate I

WARD'S NIGHT SIGNALS



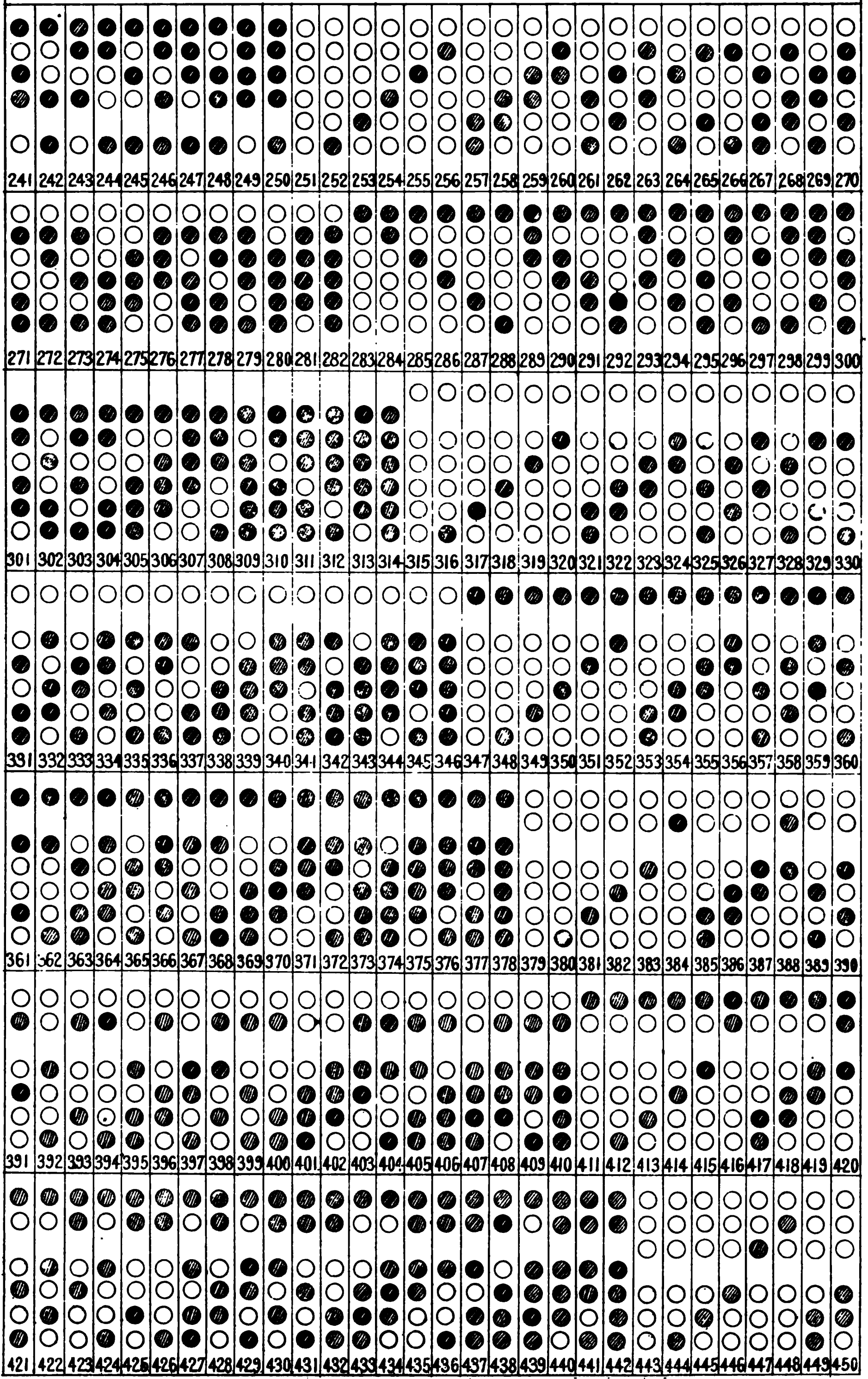
W.H. Ward Sc.

Ent: Sta: Hall

THE SHADED SPOTS INDICATE RED LIGHTS

WARD'S NIGHT SIGNALS

Plate II

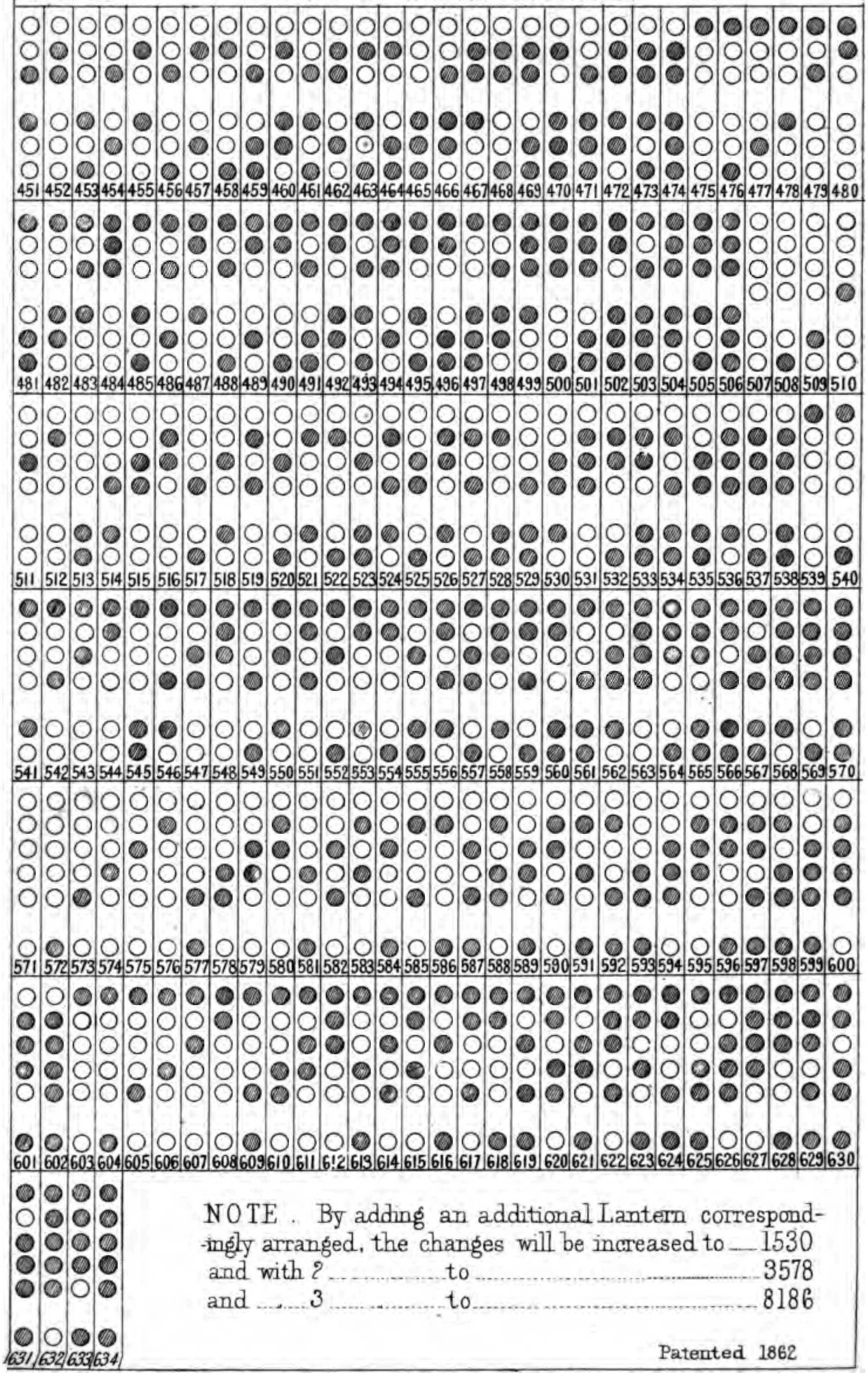


Ent: Sta: Hall

W. Francis lith.

Plate II.

WARD'S NIGHT SIGNALS.



NOTE. By adding an additional Lantern correspondingly arranged, the changes will be increased to 1530
and with 2 .... to 3578
and ...... 3 .... to 8186

Patented 1862

V.H. Ward. Sc.

Ent Sta: Hall.

W.Francis. lith:

Illustrated Descriptions

OF

WARD'S BULLET MACHINE,

SHELL MOULDING MACHINE,

AND

SELF-CENTERING RAILWAY TURN-TABLE.

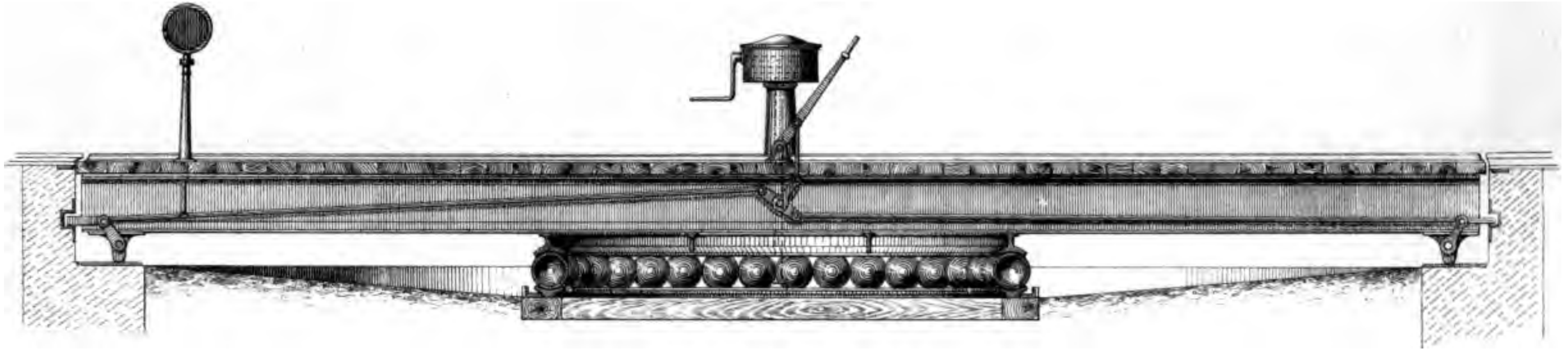
OTHECA BODLE

LONDON:
W. H. WARD, 24, UNION SQUARE, N.,
AND
AUBURN, NEW YORK, UNITED STATES,

1863.

WARD'S PATENT SELF-CENTERING TURNTABLE.

SCALE 3/16 IN.—1 FOOT.

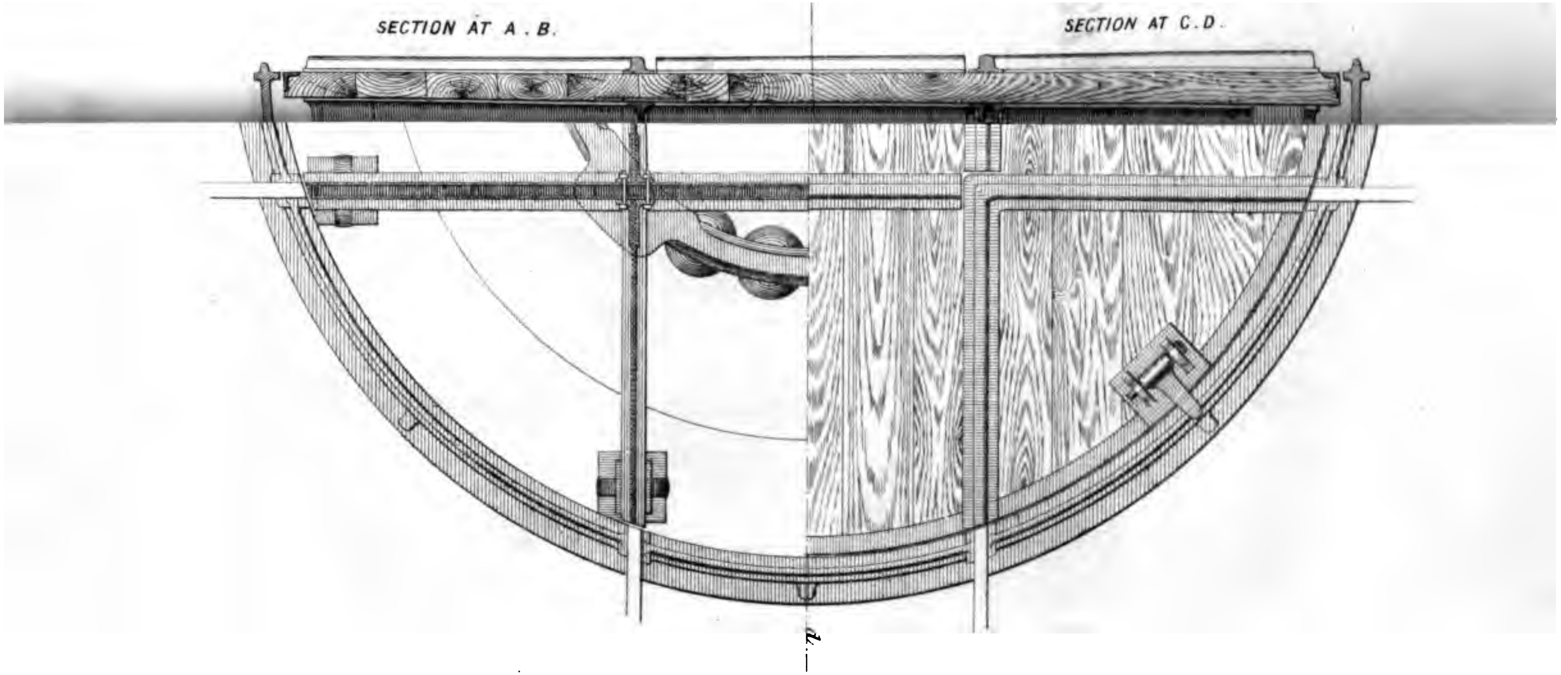


Manufactured and for sale by Lloyds, Fosters & Co., Old Park Iron Works, Wednesbury, England; and in the United States, by the undersigned Patentee, Auburn, New York.

W. H. Ward.

N.B. This arrangement of turning Platforms is well adapted for Swing-Bridges, Mortar Beds, Pivot-Gun Carriages, etc.

SCALE 3/8 IN — 1 FOOT.



MANUFACTURED BY LLOYD'S FOSTER'S & Co. OLD PARK IRON WORKS, WEDNESBURY

W Francis lith. 12. Grays Inn Terrace London W C

The wedges are three inches deep, and one-tenth taper in four inches where their power is applied in the head-blocks for securing the dies during the formation of a bullet.

The lead-wire is supplied from the reels by a self-adjusting feed, carried back by the retrograde movement of the punch-bar; to feed forward on its return (movement), by the aid of a spiral spring keeping the feed-tube-lever against the set-pin that forced it back, until the lead-wire comes in contact with an adjustable stop in the jaws of the verticle compressing forceps; which are then rigidly closed, and the horizontal cutting forceps brought into requisition, severing the lead-wire, while under transverse compression,—then by the retrograde movement of the punch-bar, the vertical forceps are opened and the severed piece drops into a receiver in front of the dies, and is forced by the punch-bar on its forward movement into the dies and forms a bullet, when a retrograde movement is given the wedge-bars separating the dies, leaving the newly formed bullet on the point of the punch, which releases itself, by its base coming in contact with the blank receiver on the retrograde movement of the punch.

The lead-wire from which the bullets are made, is caused to pass through packed oil tubes for lubricating its surface before being cut in pieces.

The *National Intelligencer*, noticed the arrival of one of these machines at the Washington Navy Yard, which had been previously examined, and favourably reported on, by a commission of scientific Army Ordnance Officers, specially appointed by the United States' Secretary at War in August, 1856, for that purpose, who made their examinations at the place of manufacture previous to the machines being shipped and received—said commission having Colonel John Symington, Ordnance Department U.S.A., as its chief.

"The new machine invented and constructed by Mr. W. H. WARD, of Auburn, New York, for the moulding of musket, rifle, and pistol balls, was landed at the yard on Saturday. It is stated to be able to produce one hundred leaden bullets per minute for any fire arm in use, of any shape and of any size whatever, up to a weight of two ounces each. This can be done, too, without attendance; the machine, after starting, taking care of itself, so to speak. All the various styles of firearms known to the English, French, Swiss and American services can be supplied with exactly suitable bullets, including the hollow, ribbed, conical and expansion varieties."—*National Intelligencer, 27th Oct.*, 1856.

"In company with a (Military) friend we went, yesterday afternoon, to see WARD'S BULLET MACHINE work, and were fully repaid by its operations for the time it cost us. The machine seemed instinct with life. We cannot describe the *modus operandi*, but the *result* was just this—heavy lead wires, passing over cylinders, were put through a course of machinery, which, in a moment, cut them off at the proper length, and almost before one could wink, dropped them out in the shape of rifle, musket, and other bullets, perfectly shaped and finished."—*Editorial remarks of the Auburn Daily American, 17th September*, 1856.

"WARD'S BULLET MACHINE is one of the most perfect pieces of mechanism of which we have any knowledge."—*Auburn Journal, September 27th*, 1856.

"THE NEW BULLET MACHINE by Mr. Ward, of Auburn, New York, is a most ingenious and original machine for manufacturing bullets from lead wire. The machine is complete within itself, requiring no attention while working, other than taking away the bullets and supplying the machine with lead. Another beautiful feature is, its perfection in doing work, using a sufficient quantity of lead and no more—it wastes nothing."—*Scientific American, New York, 11th October*, 1856.

The machine is also favorably noticed and illustrated by the *Mechanics' Magazine of the 16th May*, 1862.

THE SHELL MOULDING MACHINE.

The advantages possessed by these machines consists in their facilities for economising labor; and producing a a perfect shell, as the subjoined reports on their merits fully testify :—

Bureau of Ordnance and Hydrography,
Washington, Oct. 19, 1858.

Sir,

You are requested to have an examination made of Mr. W. H. Ward's Machine for Casting Shells, and a report sent to the Bureau of the merits of the invention.

Respectfully your obedient Servant,
D. N. INGRAHAM,
Chief of the Bureau.

To Captain John Rudd, Commmandant,
Navy Yard, Washington.

Ordnance Office, U. S., Navy Yard,
Washington, Oct. 28, 1858.

Captain John Rudd,
Commanding U.S. Navy Yard,
Washington.

Sir,

In obedience to your order of the 19th inst., I have examined and tested Mr. W. H. Ward's Machine for Casting Shells.

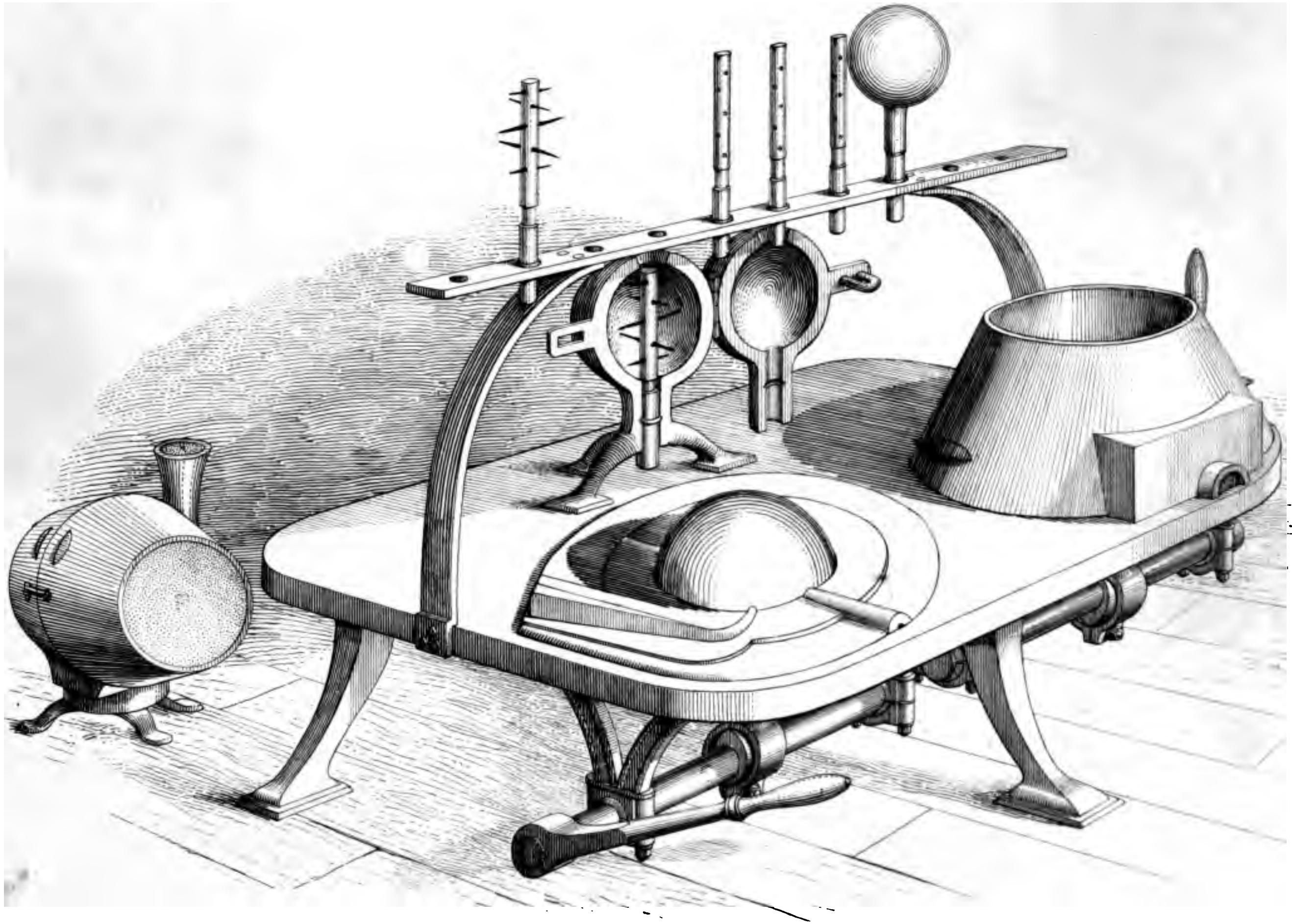
Having adjusted one of his Flasks, Mr. Ward made two 9 in. shells on the 24th inst., of our prescribed dimensions. They were perfect in every particular, and one was fired from the battery. The preparation of the mould can be made in six minutes. The adjustment of the core requires no measurement, and can be accomplished by the least skilful moulder.

The increasing demand in the Navy for shells renders it important that the most economical mode of producing them should be employed. The use of Mr. Ward's machine will tend to economise labor, and he thinks it will produce a better and sounder shell than we get from our present manner of casting. If the Bureau has no objection, I propose to test this by having several cast on his plan by our moulders.

I remain, very respectfully,
Your obedient Servant,
F. K. MURRAY,
Executive Officer, Ordnance Department.

Respectfully referred to Bureau of Ordnance and Hydrography,
John Rudd, Commander.

Plate



Ordnance Office, Washington Navy Yard,
November 12, 1858.

Sir,

I respectfully state that in obedience to your order, I have continued the experiments with Mr. Ward's Machine for making Shells, casting usually one per day. On the 10th inst., Mr. Ward reported twenty-five flasks ready for use; they were placed in the hands of the moulder, who prepared sixteen moulds with them during the forenoon. In the same time four men made by the mode at present in use forty-four. It is but justice to Mr. Ward to add, that these men worked with unusual zeal and rapidity, as the foreman of the foundry reported to me; while the operator with the other machine seems to have displayed less than the usual industry, for I have seen Mr. Ward prepare a mould, adjust the core, &c., in six minutes, and know that it has also been done by one of our own workmen.

The shells produced by the machine are in no respect inferior to those hitherto cast in the foundry.

I am, respectfully, your obedient Servant,
F. K. MURRAY,
Executive Officer Ord. Dept. in the Yard.

Capt. D. N. Ingraham,
Chief of Bureau of Ordnance and Hydrography,
Washington, D. C.

These machines are simple and very efficient, capable of moulding shells of any prescribed dimensions or form. The core being self-adjusting in the flask, whose centres coincide with each other, produces shells, the sides of which are of equal thickness and even balance, thereby securing greater accuracy of range.

Orders for these machines should be addresssed to W. H. Ward, Patentee Auburn, New York, United States, America.

N.B.—These machines are desirable acquisitions to the self-centering turn table makers.

THE SELF-CENTERING RAILWAY TURN-TABLE.

This kind of railway turn-table is now so well known that a description is almost superfluous, the novelty of which consists in the absence of the central guiding-pivot, whereby the turning platform has every possible freedom, rendering it capable of yielding to sudden heavy shocks, or lateral motion without injury—a desideratum never heretofore attained in turning platforms that depend on their central guiding-pivots for position.

These tables are capable of sustaining heavy weights, with a free and easy movement of platform, without liability to get out of order, and they improve with use.

This arrangement of turning platform is well adapted for ships, gun-proof-turrets, mortar-beds, pivot-gun-carriages, swing-bridges, cranes, dericks, etc.

By reference to the accompanying illustrations, different descriptions of tables after this plan will be observable; viz., plate VII and cut VIII represent their construction of iron as adopted in Europe, and cuts IX and X represent them as constructed in Canada and the United States.

These turn-tables are in practical use on lines of railway in East and West Canada, the United States, and in Europe, with a constant increasing demand for them throughout the world. They are constructed in the proportion of half their diameter of platform for that of the circular grooved track, for the common or smaller sizes; and one-fourth for the engine or large tables, which should never be less than 44 feet diameter of platform, so as to accommodate adjustment for empty and full tenders. While running the engine and tender on and off the platform, its circumference is supported underneath the rails by the operator's moving the lever connecting with knee-joints (or their equivalent) in the proper direction, which lever, for convenience, is placed near the gear arrangement by which he operates the table.

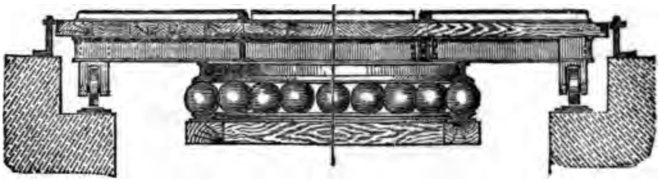
The movement of the turning platform of these tables is of such ease and freedom, that a lad *five* years old, the son of Mr. Sidney G. Miller, Contractor of the Alexandria, Loudon, and Hampshire Railway, turned one of the engine tables of that line, in presence of the President, Engineer, and Contractor, the diameter of which was 47 feet, and weighed upwards of 26 tons.

The patentee has permission to refer to the following named gentlemen, viz., Honorable Joseph Howe, Halifax, Nova Scotia; Honorable Wm. Tilley, Fredericton, New Brunswick; C. J. Brydges, Esq., Manager, Grand Trunk Railway of Canada; Charles C. Keefer, Esq., Railway Engineer, Toronto, Canada West; E. G. Phillips, Esq., General Superintendent, Western Railway, Boston Massachusetts; Honorable Chauncey Vibbard, General Superintendent, and George E. Gray, Esq , Chief Engineer, New York Central Railway, Albany, New York; L. H. Tupper, Esq., Superintendent, Rensellaer and Saratoga Railway, Troy, New York; the Superintendent of the Oswego and Syracuse Railway, Oswego, New York; Samuel B. Schenck, Esq., New York; Israel Post, Esq., Engineer, Broadway, New York; the President, Superintendent, and Engineer, Little Miami Railway, Cincinnatti, Ohio; Messrs. Pratt & Co., Buffalo, New York; Louis McKenzie, Esq., President, and Sidney G. Miller, Esq., Contractor, Alexandria, Loudon, and Hampshire Railway, Alexandria, Virginia; John Strapp, Esq., Chief Engineer, and Joseph Beattie, Esq., Engineer, London and South Western Railway, London; Edward Jones, Esq., Engineer, Wednesbury, near Birmingham; J. M. Osborne, Esq., Colonial Government Engineer, Melbourne, Victoria.

" SELF-CENTERING TURN-TABLE.

"Near the extremity of the eastern annex, and opposite the elegant saloon railway carriage, which forms so attractive a feature in that locality, Mr. W. H. Ward, of Auburn, New York, exhibits the improved self-centering turn-table, of which the subjoined is a diagram; and which is certainly one of the most useful contrivances exhibited in connection with railways and railway plant. It will be at once seen that by this arrangement the wear and tear by friction is reduced to the minimum, whilst the supports are so well distributed beneath the entire table that the labor required to turn it, even with the heaviest possible weight, is scarcely worth consideration. The table has neither rubbing journal, wheel, nor central guiding pivot, and we do not see the possibility of its getting out of order, unless by the positive grinding away of the parts, which would take years to effect. The bearing consists of a large annular groove, which takes the form of a segment of a circle, beneath the table, a corresponding annular groove reversed being provided on the foundation below the table. In the lower groove a number of hollow spheres of iron are placed, upon which the platform of the table rests, and on which it turns. The whole is now ready for use, the turning being made upon the globes with an ease that can scarcely be conceived by those accustomed to the ordinary form of table. From the simplicity and durability of the new turn-table, it becomes a question whether it could not be very extensively introduced in collieries, as well as on railways, where a few additional turn-tables might be made to economise both space and money."—*Mining Journal, Oct. 11th*, 1862.

VIII.



THE TURN TABLE MAKERS.

For additional information, until further notice, please apply to the following named Makers, or the Patentee, viz.:—

Fleming & Humbert, Phœnix Foundry, Fredericton, New Brunswick, N.A.
Chauncey Yale, Union Foundry, St. Catharine's, Canada West.
Gates & Co., Iron Works, Chicago, Illinois, United States.
R. F. Russell, Iron Works, Toledo, Ohio, United States.
Alexandria, Iron Works, Alexandria, Virginia, United States.
Lloyd's, Foster's, & Co., Old Park Iron Works, Wednesbury, England.
C. Malo, Paris, France.
H. L. Alexander, Liège, Belgium.

And the Patentee, W. H. Ward, Auburn, New York, United States.

IX.

WARD'S PATENT SELF-CENTERING RAILWAY TURN TABLE

AS

CONSTRUCTED AND USED ON THE LINES OF RAILWAY IN CANADA AND THE UNITED STATES.

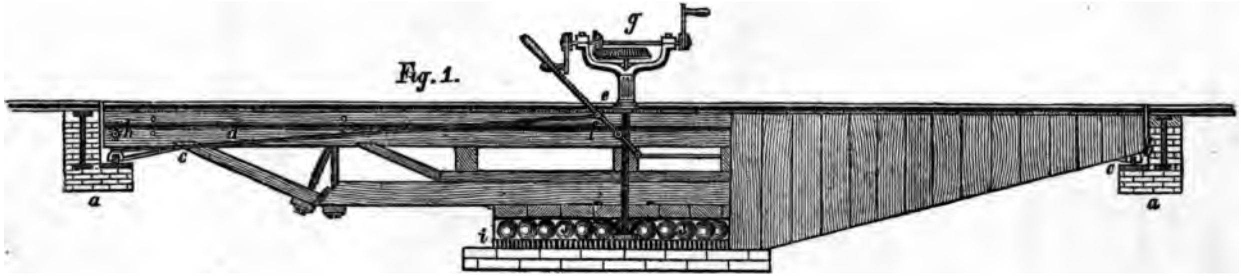


Fig. 1.

Fig. 1. Represents an elevation on the line of X X fig. 2.
Fig. 2. Represents a plan with one-half the covering removed.
Fig. 3. Represents a cross section of the circular grooved tracks.
Fig. 4. Represents the knee-joint for supporting the platform at its circumference underneath the track, while the engine is running on and off the table.

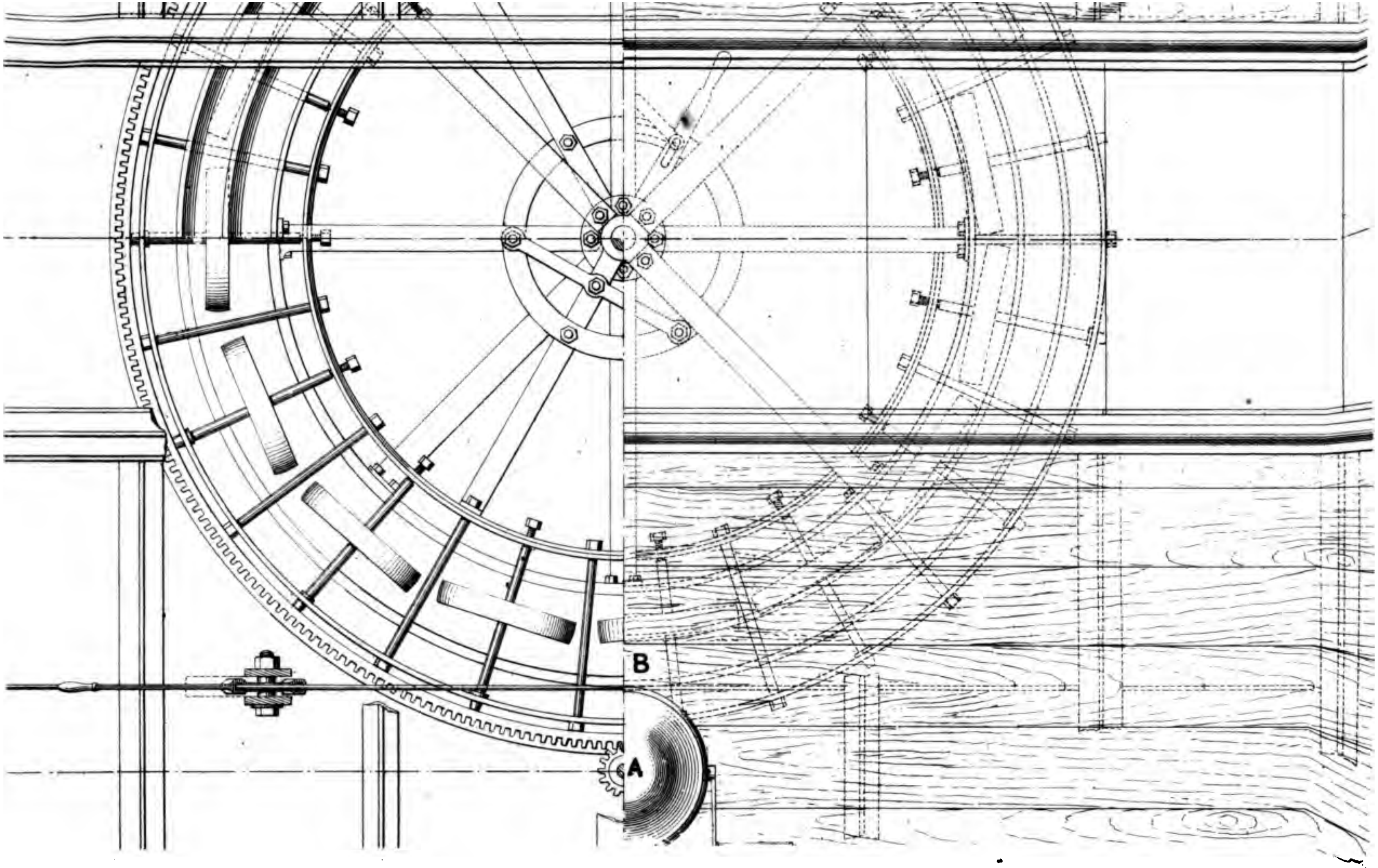
☞ **For Makers, see Page 7.**

THE TURN TABLES.

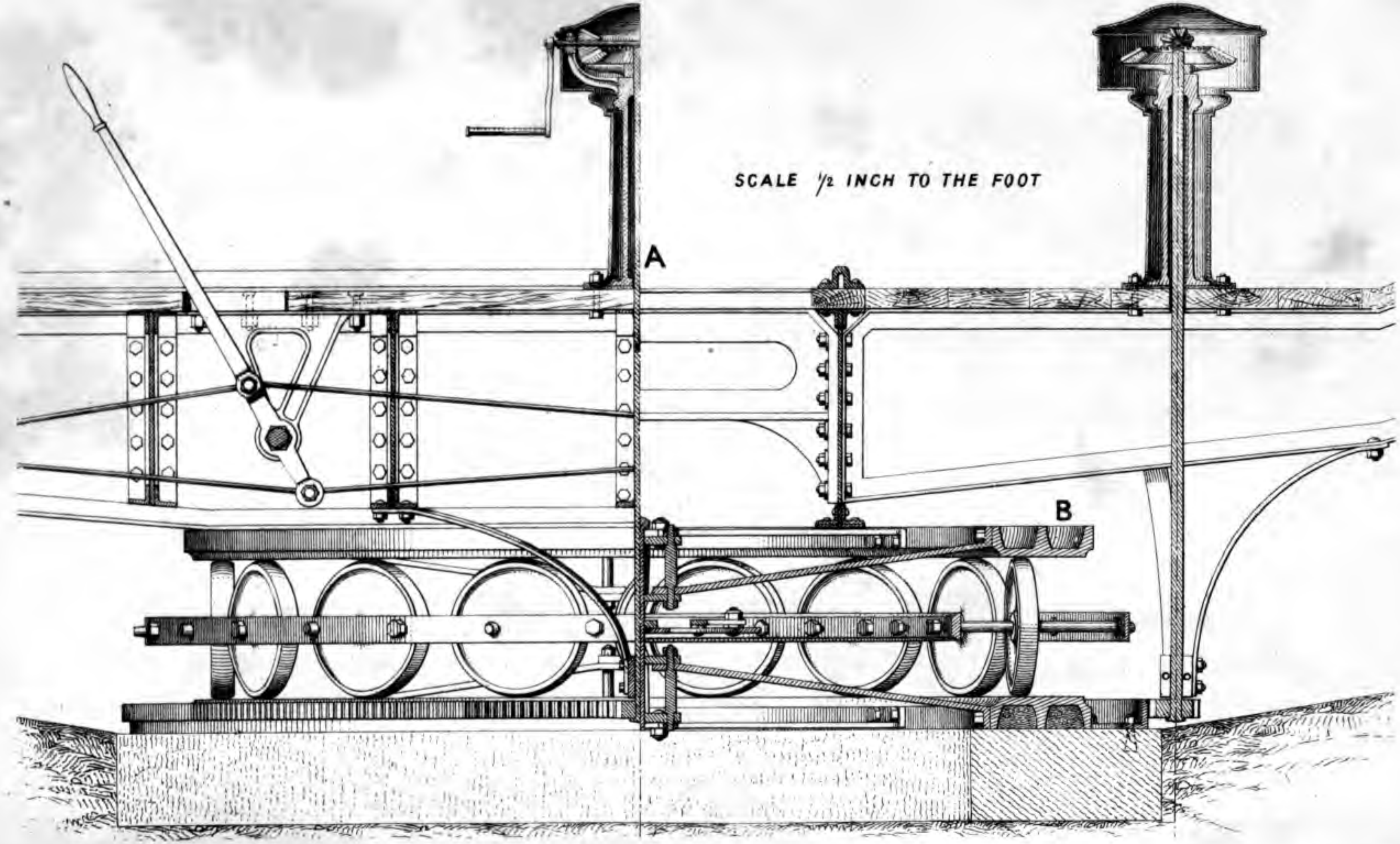
The foregoing Turn Table illustration sets forth the turning platform on spheres or hollow balls, upon which it rests, and on which it turns. But, long experience and much practical use has brought about a change from the hollow or other balls, to that of spherical tread wheels with traveling rings, revolving in circular grooved tracks, without the aid of the central guiding pivot, or its equivalent, thereby affording great freedom of the turning platform, and the most entire satisfaction.

The within illustration, illustrates a sectional elevation and plan of the central work part of an engine table with spherical tread wheels traveling between plane surfaces,—each wheel rolling in its own track—but, changeable at the pleasure of the operator by means of the hand lever for changing the adjustable center and the track of the wheels, thereby preventing any uneven wear of the tracks;—a desideratum never heretofore attained in Railway or other Turn Tables.

Orders for these Tables may be sent to Lloyds, Fosters, & Co., Old Park Iron Works, Makers, Wednesbury; or W. H. Ward, 75, Hatton Garden, London, E.C., and Auburn, New York, United States.

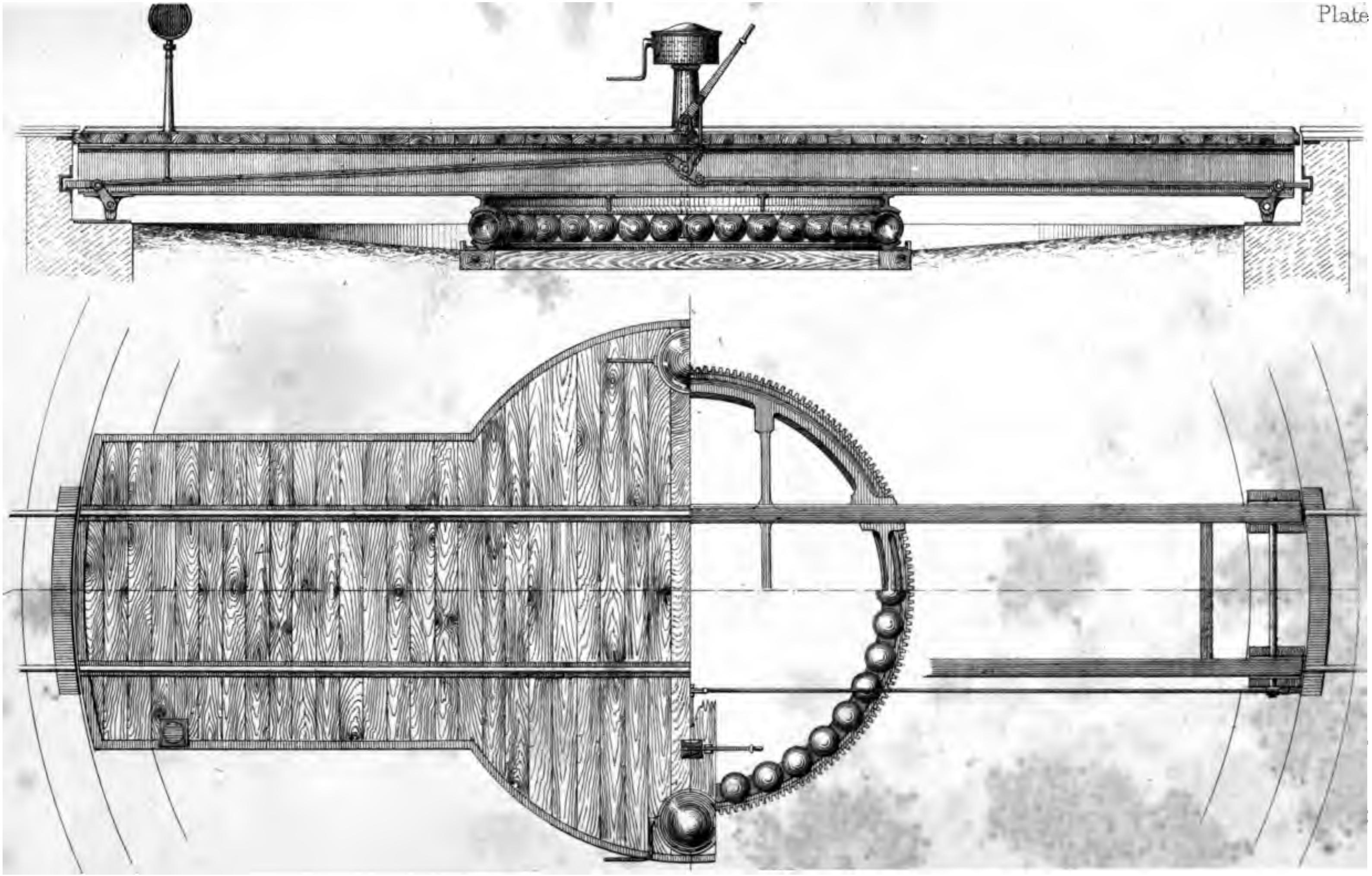


W. Francis. lith. 51. Grays Inn Road. London. W. C.



SCALE 1/2 INCH TO THE FOOT

Plate



WARD'S
INTERNATIONAL POMADE.

MANUFACTURED BY W. H. WARD,
75. HATTON GARDEN, LONDON. E.C.

W. Francis Lith. 51. Grays Inn Road. London